METEOROLOGICAL OFFICE
27 OCT 1966
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MINUTES OF THE PROCEEDINGS

OF THE

METEOROLOGICAL COUNCIL,

1884—1885

LONDON:
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Office

MINUTES OF THE PROCEEDINGS

OF THE

METEOROLOGICAL COUNCIL.

1884—85.

116, *Victoria Street, April* 9, 1884.

PRESENT:

LIEUT.-GENERAL STRACHEY IN THE CHAIR.

MR. DE LA RUE. | PROFESSOR STOKES.
MR. GALTON. | MR. STONE.
THE HYDROGRAPHER.

The Secretary was in attendance.

The Minutes of the last meeting (March 26) were read and confirmed.

Mr. Galton submitted the following draft letter to Captain Noble (Minutes, 1883, p. 125), which was approved, and the Secretary was instructed to forward it:—

739.—P.C. 878.

SIR, Meteorological Office, April 17, 1884.

YOUR letter to the Meteorological Council affords me hope that the shell firing may supply a very useful means of obtaining regular observations of the movements of the upper strata of the atmosphere.

We are, however, in the difficulty of having no employés at suitable seaside stations capable of giving the method an adequate trial. If we established a staff for the sole purpose of making one shot a day, the cost would be out of all proportion to the work done, whereas in places where artillery practice is regularly carried on, the tentative series could be made without wastefulness.

We should be relieved from a great difficulty if you could be so good as to arrange to have a (say) three months' course of observations carried on at Elswick or elsewhere under your general superintendence by competent men, we bearing the cost, and allotting a grant beforehand to cover it.

The desired observations would be one shot daily whenever the weather was suitable, and if possible, within half-an-hour of 8 a.m., at which time the regular meteorological observations are made at all our stations.

The following data would seem to be required:—

(1.) Angle of burst of shell above horizon (roughly).
(2.) Direction of drift of smoke cloud.
(3.) Interval in time between observed burst and the sound of it.
(4.) Angular velocity of smoke cloud.
(5.) Direction of wind on surface.
(6.) Force (or velocity by hand Robinson cups) of wind on surface.

The main results we should probably desire to have communicated to the Meteorological Office by telegraph.

(From the results which you have obligingly obtained for the Council they are led to believe that there would be no difficulty in determining (2) and (4). It may be mentioned also that we have an instrument for (2) and that suggestions could be made, if you desire it, as to the best means of determining both (2) and (4).)

Again, supposing after such a trial the results to be favourable, we should desire to be informed what would be the cost to us of purchasing the gun, carriage, and gear, and what would be the cost of the shells, of the charge of powder, and of everything else connected with firing, say per 100 shots.

The Council would be greatly obliged if you will consider this subject and let them know your conclusions at your convenience.

I am, &c.
(Signed) HENRY TOYNBEE,
For the Secretary.

Captain A. Noble, C.B., F.R.S.,
Elswick Works, Newcastle-upon-Tyne.

B 12184. Wt. 389.

Submitted—The following report on the forecasts for March 1884:—

The letters used have the following signification:—

a complete success.
b partial (*i.e.*, more than half) success.
c partial failure.
d total failure.

MARCH, 1884.

3.30 P.M.

DISTRICTS.		Percentages. Wind.	Weather.	Average Forecast.	Percentage of Success a + b.
SCOTLAND, N.	a	48	52	50	82
"	b	44	20	32	
"	c	8	12	10	
"	d	0	16	8	
SCOTLAND, E.	a	48	48	48	82
"	b	40	28	34	
"	c	12	20	16	
"	d	0	4	2	
ENGLAND, N.E.	a	40	52	46	82
"	b	48	24	36	
"	c	8	8	8	
"	d	4	16	10	
ENGLAND, E.	a	64	56	60	84
"	b	24	24	24	
"	c	8	4	6	
"	d	4	16	10	
MIDLAND COS.	a	56	52	54	84
"	b	32	28	30	
"	c	8	8	8	
"	d	4	12	8	
ENGLAND, S.	a	60	52	56	80
"	b	28	20	24	
"	c	12	16	14	
"	d	0	12	6	
SCOTLAND, W.	a	36	44	40	76
"	b	36	36	36	
"	c	20	16	18	
"	d	8	4	6	
ENGLAND, N.W.	a	42	46	44	77
"	b	39	27	33	
"	c	15	19	17	
"	d	4	8	6	
ENGLAND, S.W.	a	35	50	43	85
"	b	46	38	42	
"	c	15	12	13	
"	d	4	0	2	
IRELAND, N.	a	42	54	48	83
"	b	39	31	35	
"	c	15	11	13	
"	d	4	4	4	
IRELAND, S.	a	31	58	45	89
"	b	58	31	44	
"	c	7	7	7	
"	d	4	4	4	

8.30 P.M.

DISTRICTS.		Percentages. Wind.	Weather.	Average Forecast.	Percentage of Success a + b.
SCOTLAND, N.	a	48	65	57	88
"	b	39	23	31	
"	c	13	3	8	
"	d	0	9	4	
SCOTLAND, E.	a	68	58	63	89
"	b	26	26	26	
"	c	6	13	10	
"	d	0	3	1	
ENGLAND, N.E.	a	55	43	49	84
"	b	32	37	35	
"	c	10	3	6	
"	d	3	17	10	
ENGLAND, E.	a	50	40	45	85
"	b	37	43	40	
"	c	3	10	7	
"	d	10	7	8	
MIDLAND COS.	a	60	37	49	80
"	b	23	40	31	
"	c	7	17	12	
"	d	10	6	8	
ENGLAND, S.	a	58	40	49	79
"	b	23	37	30	
"	c	10	20	15	
"	d	9	3	6	
SCOTLAND, W.	a	42	54	48	81
"	b	42	23	33	
"	c	10	10	10	
"	d	6	13	9	
ENGLAND, N.W.	a	57	53	55	80
"	b	30	20	25	
"	c	10	17	14	
"	d	3	10	6	
ENGLAND, S.W.	a	54	52	53	87
"	b	40	27	34	
"	c	3	14	8	
"	d	3	7	5	
IRELAND, N.	a	50	57	54	86
"	b	32	32	32	
"	c	11	11	11	
"	d	7	0	3	
IRELAND, S.	a	50	57	54	82
"	b	25	32	28	
"	c	7	7	7	
"	d	18	4	11	

SUMMARY.

BRITISH ISLES	a	46	51	49	82
"	b	39	28	33	
"	c	12	12	12	
"	d	3	9	6	

BRITISH ISLES	a	54	51	53	84
"	b	32	31	31	
"	c	8	11	10	
"	d	6	7	6	

Reported—That the cheque for 100*l.*, Minutes, 1883, p. 125, had been forwarded to the Scottish Meteorological Society with the following letter :—

(M.O. 729.)

SIR, Meteorological Office, March 31, 1884.

I AM directed by the Meteorological Council to forward a cheque for 100*l.*, being the contribution of the Council for the Ben Nevis observations for the year ending the 31st March 1884.

The Council desire me to say, with reference to the correspondence that has passed on the subject of the exclusive or preferential rights of publication conveyed to the Press Association by the Directors of the observatory, that your statement that "it was arranged, in compliance " with a wish expressed by the Meteorological Council, that Mr. Omond should send occasional " telegrams to the Meteorological Office whenever any striking change of conditions or special " phenomena of great interest occurred. The information sent in these occasional telegrams the " Meteorological Office is of course at liberty to publish," is for the present satisfactory, as the Council do not at present desire to make further use of the Ben Nevis observations. But they must distinctly state that the continuance of their contribution in the future must depend on their receiving, for publication in any manner they think most suitable, such information from the observatory as they may from time to time require for the preparation of the daily forecasts or weather reports.

The Council observe that the present arrangement with the Press Association does not extend beyond the end of the current year, and they trust that before it is prolonged the Directors will give the Council the opportunity of communicating their views as to the manner in which the interests they represent may be protected, so that all misconceptions shall be avoided, and no disagreeable discussions arise.

I am, &c.

A. Buchan, Esq., Secretary, (Signed) ROBERT H. SCOTT.
Scottish Meteorological Society.

A further letter from Mr. Abercromby on the subject of cloud photographs was read (No. 858) (Minutes, 1883, p. 136).

Resolved—That the sum of 25*l.* be granted to him for 25 negatives, carte-de-visite size. (P.C. No. 839.)

Submitted—The following report :—

SIR, Meteorological Office, March 31, 1884.

I HAVE the honour to report, for the information of the Council, on the work which has been done for the quarter ending 31st March 1884.

The mean pressure chart of the Atlantic Ocean for the month of February, referred to in my last report (Minutes, 9th January 1884, p. 5), has been completed.

The following pressure charts have also been drawn during the quarter :—

Pacific Ocean for August.
Indian „ „ „
Indian „ „ February.

The chart of the Pacific Ocean for February is in a very advanced state.

I have also prepared for printing a chart for the North Atlantic synchronous work.

I am, &c.

(Signed) C. W. BAILLIE,
Nav. Lieut. R.N.

The Marine Superintendent.

Forwarded for the consideration of the Council.—H. T.

Read—A memorandum from Captain Toynbee reporting that since the last meeting three logs had been received, all of them being " excellent."

Observer.	Ship.	Period.	Voyage.	Last mention on Minutes.
Capt. Alex. Becket -	" Amana " -	Jan. 13, 1883—March 31, 1884.	Liverpool, Sydney, California, and home.	1882, p. 65.
Capt. A. Campbell -	S.S. " Circassia "	Sept. 14, 1883—Feb. 29, 1884.	Glasgow to New York, four voyages.	1883, p. 54.
Capt. A. W. Jeffery	S.S. " Teniers "	Jan. 12—Mar. 22, 1884.	Antwerp, River Plate, and home.	1883, p. 90.

Mr. Scott was instructed to convey the best thanks of the Council to the above observers.

Submitted the following statements of work for March 1884:—

April 8, 1884.

MARINE ROOM.

Examined 19 new logs and one light house register.

North Atlantic Weather Charts.

The isobars for October in progress, and the first drawing of the air and sea isotherms for the same month completed. Weather for August 1882 prepared for exhibiting on reduced charts.

The preparation of sea observations for the 13 months kept up to date. Observations at several stations in Labrador for the full period under discussion have been received through Dr. Neumayer, and are in a forward state of preparation.

Testing the results (isobars and isotherms of air and sea), to be obtained from using 150, 200, and 400 observations per day respectively.

Forms received from captains acknowledged and fresh supplies forwarded.

About three weeks of one clerk's time occupied in collecting data from ships in London and Liverpool.

Preparing, for the information of the Council, a report on the present condition of the work.

The staff of female clerks chiefly employed on advancing the charts for October and November 1882.

General.

A copy of the North Atlantic Weather Chart for August 23, 1882, made for Dr. Neumayer.

Indexing data in ocean 10-degree squares.

Copying into Log 5778 the observations for three months contained in the "Rough Book" lent by the observer.

The Marine Superintendent. (Signed) CHAS. HARDING.

Forwarded for the information of the Council.—H. T.

TELEGRAPHIC (FORECAST AND STORM WARNING) BRANCH.

April 9, 1884.

Preparing Monthly Weather Report.—February 1884, completed and handed in; *March* 1884, in hand; will be ready by 16th; *January, February* 1883, tables and rough maps all prepared (awaiting instructions for completion).

Forecast Checking.—All arrears are now overtaken, and the work is being carried on up to date. (Summary for March submitted herewith.)

Storm Warning Checking, 1883.—In hand, and completed as far as to end of March.

Monthly and Annual Rainfall Values for 1883 (for Mr. Symons).—Prepared for 30 stations and forwarded.

Calculation of Values for Accumulated Heat, Rainfall, and Bright Sunshine for each week in the first quarter of the years 1878 to 1883.—In hand; about one third done, and being pushed forward rapidly.

Form for publication of same.—Prepared, submitted, and approved.

Form (revised) for future publication of the Quarterly Summary of the Weekly Weather Report.—Prepared, submitted, and approved.

(Signed) FREDC. GASTER.

March 31, 1884.

PANTAGRAPH ROOM.

Quarterly Weather Report, Part III., 1876.—Proofs of letter-press and plates have undergone a second revise and been forwarded for press.

Part IV., 1876.—The monthly remarks have been written, chart plates checked, tables of cyclones and anticylones prepared, &c., and the whole of the part will be ready for the printer in a few days.

Part I., 1877.—The wind averages have been worked and the monthly wind charts drawn; the gale tables checked, and progress made with the daily charts.

Harmonic Analyser.—The special work on the barometer constants for 1876 have been completed, and the analysis of thermograms for 1878 carried as far as Falmouth, which station is nearly completed.

Miscellaneous.—Proofs of the rainfall diagrams showing hourly frequency and amount have been checked. A set of zinc plates has been prepared and ruled ready for the reduction of further barograms, showing the Krakatoa oscillation of last August, &c.

R. H. Scott, Esq., F.R.S., &c. (Signed) R. H. CURTIS.

EXAMINATION ROOM.

SIR, April 1, 1884.

THE following *Curves* and *Tabulations* have been examined during the month of March 1884:—August 1882: *Anemograms*, four stations; September 1882: *Thermograms*, three stations; *Barograms*, one station; *Anemograms*, one station.

The *Notes of Errors* and monthly reports thereon for May, June, July, and August 1882 have been written out, and the examination of the daily rainfalls at Glasgow, Aberdeen, Falmouth, Stonyhurst, and Kew 1883, for Symons's "Rainfall" has been done.

I am, &c.

R. H. Scott, Esq., M.A., F.R.S.,
Secretary, Meteorological Council.

(Signed) T. E. ALLEN.

Reported—That Mr. H. N. Cobley had died on the 5th instant.

Reported—That the following cheques have been drawn during the month of March :—

1884.		£	s.	d.	£	s.	d.
March 1st.	For weekly salaries				28	14	11
„ „	C. E. Strachan, Arctic work				2	5	0
„ 5th.	J. Green, care of Bermuda anemometer				4	12	0
„ 8th.	For weekly salaries				28	14	11
„ „	Pall Mall Coal Co., coals				5	5	0
„ 15th.	For weekly salaries				28	14	11
„ „	G. Neumayer, synoptic charts				37	10	0
„ „	Postmaster-General, telegrams				177	6	1
„ „	W. Wightman & Co., special printing				7	0	0
„ „	G. Paulet, Paris synchronous observations				21	16	6
„ „	J. H. Woodstock, packing cases				2	6	0
„ 22nd.	For weekly salaries				28	14	11
„ 29th.	Do. do.				28	14	11
„ 31st.	Lieut.-General R. Strachey, R.E., C.S.I. (Council Fees.)	293	4	6			
„ „	W. De La Rue (Council Fees.)	130	0	6			
„ „	Sir Frederick Evans, R.N., K.C.B. (Council Fees.)	102	16	10			
„ „	F. Galton (Council Fees.)	157	4	6			
„ „	G. G. Stokes (Council Fees.)	151	15	8			
„ „	E. J. Stone (Council Fees.)	140	18	2			
					*976	0	2
„ „	R. H. Scott, salary				66	13	4
„ „	J. S. Harding, jun., salary	27	15	6			
„ „	T. D. Bell „	14	8	10			
					42	4	4
„ „	C. W. Jacques, rent				158	15	0
„ „	General Life and Fire Assurance Co.	1	6	0			
„ „	„ „ „ Insurance	1	2	0			
					2	8	0
„ „	Williams & Norgate, books				4	1	3
„ „	J. S. Harding, sen., pension (Minutes, 1882, p. 43)				10	14	1
„ „	Scottish Meteorological Society, Ben Nevis observations, 1883-84				100	0	0
„ „	W. Thomas, care of Scilly anemometer	1	13	7			
„ „	„ meteorological reports	4	19	4			
					6	12	11
„ „	H. Williams, care of bridled anemometer	2	16	6			
„ „	„ care of Robinson's „	2	13	4			
					5	9	10
	Carried forward				£1,774	14	1

	£	s.	d.
* Deductions for Income Tax (Cash Book, fo. 198)	20	16	8
Expenses per J. S. Harding, junr. (Cash Book, fo. 199)	3	3	2
Amount paid this day, as above	976	0	2
	£1,000	0	0

			£ s. d.	£ s. d.
1884.		Brought forward -	- -	1,774 14 1
March 31st.	C. Niven, Aberdeen Observatory	-	66 17 4	
„ „	J. L. E. Dreyer, Armagh „	-	17 12 6	
„ „	W. L. Fox, Falmouth „	-	52 9 0	
„ „	Kew Committee, allowance -	-	100 0 0	
„ „	C. Coulston, Orkney -	- -	2 16 9	
„ „	G. H. Aird, Seaham -	- -	2 13 9	
„ „	S. J. Perry, Stonyhurst	- -	14 0 0	
				256 9 4
„ „	J. E. Cullum, Valencia	- -	65 0 7	
„ „	„ salary -	- -	16 13 4	
				81 13 11
„ „	G. T. Watson, care of Yarmouth anemometer	-	4 2 0	
„ „	„ meteorological reports		4 12 0	
				8 14 0
„ „	R. & J. Beck, zinc plates	- -	- -	2 11 0
„ „	R. H. Curtis -	Discussion, &c. of observations.	22 4 5	
„ „	J. A. Curtis -		16 3 7	
„ „	T. E. Allen -		15 11 1	
„ „	C. H. Thompson -		11 3 4	
„ „	H. N. Cobley -		10 5 11	
„ „	E. G. Aldridge -		9 15 10	
				85 4 2
„ „	H. Todd, Cambridge	- - -	4 11 0	
„ „	H. Mohn, Christiania	- - -	5 10 0	
„ „	J. Costello, Dover	- - -	3 18 6	
„ „	W. Brand, Dunrossness	- -	2 7 3	
„ „	W. Foster, Hawes Junction	- -	3 18 3	
„ „	G. Jones, Holyhead	- - -	3 18 0	
„ „	G. G. Appleton, Hurst Castle	- -	3 18 0	
„ „	J. Fisher, Jersey	- - -	3 2 6	
„ „	F. Gaster, London	- - -	3 18 0	
„ „	W. Berridge, Loughborough	- -	3 5 10	
„ „	K. Kerr, Mullaghmore	- -	5 5 1	
„ „	W. D. Penny, Nairn	- - -	4 4 6	
„ „	W. Wickham, Oxford	- - -	3 12 6	
„ „	G. Phillips, Parsonstown	- -	3 7 6	
„ „	J. John, Prawle Point	- - -	3 5 0	
„ „	G. Baker, St. Ann's Head	- -	3 7 1	
„ „	J. B. Smith, Spurn Head	- -	3 5 5	
„ „	D. Macdonald, Stornoway	- -	5 11 8	
„ „	J. Sinclair, Wick	- - -	3 5 0	
„ „	A. Guy, York -	- - - -	3 18 0	
				77 9 1
„ „	Postmaster-General, private wire (Mullaghmore)		-	31 5 0
„ „	F. Gaster -	Preparation, &c. of Weather Reports.	30 8 4	
„ „	F. J. Brodie -		20 12 10	
„ „	G. G. Francis -		19 15 10	
„ „	A. J. Rigby -		15 0 0	
„ „	R. Sargeant -		13 13 1	
				99 10 1
„ „	A. Buchan, salary	- - -	37 10 0	
„ „	„ travelling expenses	-	6 19 9	
				44 9 9
„ „	W. C. Ley, salary	- - -	- -	37 10 0
		Carried forward -	-	£2,499 10 5

1884.			£	s.	d.	£	s.	d.
		Brought forward -	-		-	2,499	10	5
March 31st.	Capt. H. Toynbee -	Discussion, &c. of observations and care of instruments.	33	6	8			
„ „	Nav. Lieut. C. W. Baillie, R.N. - -		20	16	8			
„ „	R. Strachan - -		27	15	6			
„ „	C. Harding - -		22	4	5			
„ „	H. Harries - -		13	6	8			
„ „	W. Allingham - -		13	6	8			
„ „	W. G. James - -		9	12	0			
						140	8	7
„ „	J. R. Jones, Aberdeen agent - -		6	13	5			
„ „	J. Fowler, Cardiff „ - -		3	15	0			
„ „	L. Allen, Dundee „ - -		2	10	0			
„ „	Z. Scaping, Hull „ - -		1	7	6			
„ „	J. Gill, Liverpool „ - -		16	19	9			
„ „	G. H. Permain, Southampton agent -		3	12	6			
						34	18	2
„ „	P. Adie, repairing "A" barometers -		18	8	6			
„ „	„ „ "B T" „ -		2	12	6			
„ „	„ additions to eidograph -		2	7	6			
						23	8	6
„ „	J. S. Harding, jun., petty cash -		-		-	30	0	0
		Total -				£2,728	5	8

116, *Victoria Street, May* 7, 1884.

PRESENT:

LIEUT.-GENERAL STRACHEY IN THE CHAIR.

MR. DE LA RUE. | PROFESSOR STOKES.
MR. GALTON. | MR. STONE.
THE HYDROGRAPHER.

The Secretary was in attendance.

The Minutes of the last meeting (April 9) were read and confirmed.

The first draft of the Report for the year 1883–4 was submitted.

Mr. Scott submitted price lists from the Autotype and the Woodbury Company (Letter 1084), for the reproduction of Mr. Abercromby's cloud pictures, and he was instructed to have experiments made with four typical pictures.

Read—A memorandum from Captain Toynbee reporting that since the last meeting 20 logs had been received, 14 of them being "excellent."

Observer.	Ship.	Period.	Voyage.	Last Mention on Minutes.
Mr. D. W. Barker, F. R. Met. Soc. (Chief Officer).	"Superb" -	Feb. 19, 1883—Apl. 18, 1884.	Melbourne, San Francisco, and home.	1882, p. 79.
Capt. H. Davison -	S.S. "Oceanic"	Jan. 30, 1883—Feb. 8, 1884.	China, Japan, San Franciso.	—
Capt. G. Denham -	S.S. "Erl King"	Dec. 28, 1883—March 3, 1884.	Liverpool and New Orleans.	1883, p. 136.
Capt. W. V. Graham	"Bowfell" -	June 5, 1883—April 16, 1884.	Cardiff, Manila, and home	—
Capt. P. M. Hayward, log kept by—	S.S. "Dacia" -	Oct. 4, 1883—April 5, 1884.	Laying cable in N. Atlantic.	—
Mr. A. S. Thomson Chief Officer.	- - - - -	- - - - -	- - - - -	1880, p. 116.
Capt. J. Holloway -	S.S. "Bombay"	Dec. 1, 1883—April 8, 1884.	London to New Zealand viâ Cape of Good Hope, and home viâ Cape Horn.	—
Capt. W. H. Kidley	S.S. "Coptic" -	May 10,—Nov. 9, 1882.	China, Japan, and San Francisco.	1883, p. 136.
Capt. J. Metcalfe -	S.S. "Oceanic"	Sept. 14, 1882—Jan. 15, 1883.	China, Japan, and San Francisco.	1883, p. 36.
Capt. P. Murdoch -	"Sierra Estrella"	Feb. 6, 1883—April 22, 1884.	Melbourne, San Francisco, and home.	1882, p. 79.
Lieut. C. F. Oldham, R.N. (commanding), and Lieut. A. Leeper, R.N.	H.M.S. "Lark"	Oct. 12, 1883—Feb. 12, 1884.	Australian Station -	1883, p. 136.
Capt. C. W. Pearson	S.S. "Strathleven"	July 12, 1883—Feb. 28, 1884.	Japan, New York, Savannah.	1883, p. 54.
Capt. C. H. Renaut	"Pleione" -	July 20, 1883—April 26, 1884.	Wellington, New Zealand, and home.	1883, p. 11.
Capt. R. S. Tannock	"Glencairn" -	July 28, 1883—April 25, 1884.	Liverpool, Chittagong, and home.	1883, p. 44.
Capt. W. Waring -	S.S. "Gordon Castle."	March 10, 1883—April 21, 1884.	London, China, Australia, New Zealand, China, Japan, New York.	1882, p. 96.

Mr. Scott was instructed to present the Charts (O. 27) to Captains Davison, Graham, Hayward, and Holloway, and to convey the best thanks of the Council to the other observers.

Submitted—The Barometer Manual for Seamen.

Reported that Herr von Freeden was desirous of issuing a translation of the work into German, and had sought to obtain through the Meteorological Office permission

Office

of the Stationery Office to do so. A reply (Letter 932) had been received stating that the permission could be granted by the Council if they thought it desirable.

Mr. Scott was instructed to inform Herr von Freeden (P.C. 1030) that the permission would be granted; provided that no exclusive copyright was claimed in Germany, and that the source whence the book was derived was stated.

Submitted—The following Report on the Forecasts for April 1884:—

The letters used have the following signification:—

a complete success.
b partial (*i.e.*, more than half) success.
c partial failure.
d total failure.

APRIL.

Districts.		3.30 P.M. Wind.	3.30 P.M. Weather.	3.30 P.M. Average Forecast.	3.30 P.M. Percentage of Success a + b.	8.30 P.M. Wind.	8.30 P.M. Weather.	8.30 P.M. Average Forecast.	8.30 P.M. Percentage of Success a + b.
Scotland, N.	a	44	44	44		40	47	44	
"	b	36	44	40	84	30	33	31	75
"	c	16	8	12		20	13	17	
"	d	4	4	4		10	7	8	
Scotland, E.	a	56	56	56		57	60	59	
"	b	24	36	30	86	20	30	25	84
"	c	16	4	10		13	10	11	
"	d	4	4	4		10	0	5	
England, N.E.	a	48	60	54		50	55	53	
"	b	40	24	32	86	30	28	29	82
"	c	8	12	10		13	10	11	
"	d	4	4	4		7	7	7	
England, E.	a	64	60	62		50	55	53	
"	b	24	28	26	88	37	31	34	87
"	c	12	8	10		10	14	12	
"	d	0	4	2		3	0	1	
Midland Cos.	a	52	68	60		47	68	58	
"	b	36	24	30	90	33	18	25	83
"	c	8	4	6		13	14	14	
"	d	4	4	4		7	0	3	
England, S.	a	48	56	52		57	62	60	
"	b	48	40	44	96	37	24	30	90
"	c	4	0	2		3	11	7	
"	d	0	4	2		3	3	3	
Scotland, W.	a	48	48	48		43	55	49	
"	b	12	44	28	76	17	38	28	77
"	c	16	4	10		27	4	15	
"	d	24	4	14		13	3	8	
England, N.W.	a	56	52	54		50	59	55	
"	b	20	16	18	72	27	28	27	82
"	c	16	20	18		10	10	10	
"	d	8	12	10		13	3	8	
England, S.W.	a	40	52	46		33	59	46	
"	b	44	16	30	76	33	15	24	70
"	c	8	12	10		17	11	14	
"	d	8	20	14		17	15	16	
Ireland, N.	a	24	40	32		27	45	36	
"	b	28	48	38	70	23	33	28	64
"	c	24	0	12		27	11	19	
"	d	24	12	18		23	11	17	
Ireland, S.	a	56	68	62		43	63	53	
"	b	28	24	26	88	27	30	29	82
"	c	8	0	4		17	7	12	
"	d	8	8	8		13	0	6	

SUMMARY.

British Isles	a	49	55	52		45	57	51	
"	b	31	31	31	83	29	28	29	80
"	c	12	7	10		15	11	13	
"	d	8	7	7		11	4	7	

Submitted—The following statements of work for April 1884 :—

MARINE ROOM.

May 6, 1884.

Examined 16 new logs and 2 lighthouse registers.

North Atlantic Weather Charts.

The first drawing of October 1882, isobars completed.
The weather for September 1882, prepared for exhibiting on the reduced charts.
The preparation of sea and land observations kept up to date.
Several additional land stations prepared and plotted.
The "tracings" of barometer air and sea temperature, and weather observations made for November 1882.
Drawing of isobars, and air and sea isotherms for February 9, 1883, from 150, 200, and 400 observations to test the value of lines obtained under these different data completed.
Acknowledging forms received from captains and forwarding fresh supplies.
One clerk employed five days in collecting data from ships arriving in London.
The female clerks chiefly engaged completing their part of the November charts and advancing those for December and subsequent months.

General.

Completing the copying in log 5778 of the observations contained in the Rough Book lent by the observer.
Indexing data in ocean 10-degree squares.

(Signed) CHAS. HARDING.

The Marine Superintendent.

Forwarded for the information of the Council.—H. T.

TELEGRAPHIC (FORECAST AND STORM WARNINGS) BRANCH.

Preparation of Monthly Weather Report.—1884, *March* completed, awaiting result of inquiry into one or two discrepancies (also delayed somewhat by Easter holidays and by computation of arrears of accumulated heat, sunshine, and rainfall). *April*, in hand, material worked up to date. 1883. *January, February*, and *March*—Tables for section 3, and rough maps all prepared (awaiting further instructions).
Daily Forecast Checking.—All done up to date. Summary for April submitted herewith.
Storm Warning Checking, 1883.—In hand, and about three-fourths completed.
Calculation of Values for accumulated Heat, Bright Sunshine, and Rainfall, for First Quarter of Years 1878 *to* 1883.—Necessary values all extracted, and computations three-fourths done.

(Signed) FREDC. GASTER.

PANTAGRAPH ROOM.

May 1, 1884.

Quarterly Weather Report, Part IV., 1876.—The tables, charts, &c. have been completed, and the whole of the letterpress forwarded for the printer.
Part I., 1877.—Chart plates have been drawn for use in preparing the "general summary" and the daily charts, for the lithographer's use, for about half the quarter. The general summary of the weather is nearly completed.
Revised proofs of rainfall diagrams have been checked, and a table of contents for 1876 prepared as far as it could be carried.
Harmonic Analyser.—The analysis of the temperature curves for 1878 has been completed, and all the constants for that year worked out from the analyser figures.
Miscellaneous.—Some time was occupied in work connected with the Krakatoa barometric oscillation of last August.

(Signed) R. H. CURTIS.

R. H. Scott, Esq., F.R.S., &c.

EXAMINATION ROOM.

SIR, May 1, 1884.

The following *Curves* and *Tabulations* have been examined during the month of April 1884 :—
September (1882), *Anemograms*, two stations ; *Thermograms*, four stations ; *Barograms*, six stations.
Also, such portion of the January, February, and March, 1884, work of Valencia required for the report of the Registrar General of Ireland.

I am, &c.

R. H. Scott, Esq., M.A., F.R.S.,
Secretary, Meteorological Council.

(Signed T. E. ALLEN.

Mr. Scott reported that by the instructions of the Chairman he had appointed Mr. S. Call to fill the situation left vacant by the death of Mr. Cobley (Minutes, p. 4), at the salary of 130*l.* per annum.

The Council authorised the payment of the salary of the late Mr. Cobley to the end of the June quarter.

Reported—That the following cheques were drawn during the month of April :—

1884.			£	*s.*	*d.*
5th	April.	P. & O. Steam Navigation, freight	2	11	6
,,	,,	W. Allingham, collection of synchronous observations (Minutes, May 10, 1883)	10	2	5
,,	,,	For weekly salaries	28	14	11
9th	,,	G. A. Gillett, wood, oil, &c.	3	9	7
,,	,,	C. E. Strachan, Arctic work (Minutes, May 10, 1883)	2	9	6
,,	,,	Kew Committee, verifications	18	11	6
,,	,,	R. H. Scott, petty cash	30	0	0
12th	,,	For weekly salaries	28	14	11
19th	,,	,, ,,	28	14	11
26th	,,	,, ,,	28	14	11
,,	,,	Gas Light and Coke Co., gas	8	5	6
,,	,,	Staff Commander J. C. Richards, R.N., revision of Barometer Manual (Minutes, March 26, 1884)	10	10	0
,,	,,	F. Dangerfield, delivery of Daily Weather Charts	11	13	3
,,	,,	Watson Brothers, S. R. Aneroid	6	4	6
,,	,,	D. Macgregor & Co., Glasgow agents	9	9	3
30th	,,	R. H. Scott, salary	66	13	4
,,	,,	J. S. Harding, jun., salary	27	15	6
,,	,,	T. D. Bell, salary	14	8	10
,,	,,	J. E. Cullum (Valencia), salary	16	13	4
,,	,,	R. H. Curtis — Reduction, &c. of observations.	22	4	5
,,	,,	J. A. Curtis — Reduction, &c. of observations.	*16	13	4
,,	,,	T. E. Allen — Reduction, &c. of observations.	15	11	1
,,	,,	C. H. Thompson — Reduction, &c. of observations.	*11	13	4
,,	,,	H. N. Cobley — Reduction, &c. of observations.	*10	16	8
,,	,,	E. G. Aldridge — Reduction, &c. of observations.	7	16	8
,,	,,	F. Gaster — Preparation, &c. of Weather Reports.	30	12	8
,,	,,	F. J. Brodie — Preparation, &c. of Weather Reports.	20	7	2
,,	,,	G. G. Francis — Preparation, &c. of Weather Reports.	19	18	8
,,	,,	A. J. Rigby — Preparation, &c. of Weather Reports.	†16	5	0
,,	,,	R. Sargeant — Preparation, &c. of Weather Reports.	13	9	5
,,	,,	Capt. H. Toynbee — Discussion, &c. of observations and care of instruments.	33	6	8
,,	,,	Nav. Lieut. C. W. Baillie, R.N. — Discussion, &c. of observations and care of instruments.	20	16	8
,,	,,	R. Strachan — Discussion, &c. of observations and care of instruments.	27	15	6
,,	,,	C. Harding — Discussion, &c. of observations and care of instruments.	22	4	5
,,	,,	H. Harries — Discussion, &c. of observations and care of instruments.	13	6	8
,,	,,	W. Allingham — Discussion, &c. of observations and care of instruments.	13	6	8
,,	,,	W. G. James — Discussion, &c. of observations and care of instruments.	9	12	0
,,	,,	Pall Mall Coal Co., coals	5	0	0
,,	,,	T. De La Rue & Co., Sunshine Cards	9	12	6
,,	,,	J. J. Hicks, Thermometer screen and Rain-gauge jars	9	5	0
,,	,,	Postmaster-General, telegrams	194	1	9
,,	,,	J. Green, care of Bermuda anemometer	4	11	0
,,	,,	J. S. Harding, jun., petty cash	50	0	0
			£952	4	11

* Increment as per Minutes, June 6, 1883.

† Increment as per Minutes, May 17, 1882.

Submitted—The following statement of accounts for the year ending 31st March 1884:—

Income.	£ s. d.	£ s. d.
Balance from year 1882–83		883 15 1
Vote for year		15,300 0 0
Repayment of expenses charged under—		
(1.) Incidental expenses	18 12 1	
(2.) Special researches	26 0 5	
(3.) Observatories and stations	48 1 4	
		92 13 10
Supply of Weather Information:		
D.W. Charts and Forecasts	280 1 4	
6 p.m. Charts	25 0 0	
Information for Press Agencies, &c.	94 11 9	
Telegrams	245 16 1	
Miscellaneous data	36 1 4	
		681 10 6
Sale of Instruments, &c.:		
Mercantile Marine account	75 16 7	
Royal Navy	49 14 6	
		125 11 1
Commission charged on work done for Colonies, &c.		46 5 1
		£17,129 15 7

Expenditure.	£ s. d.	£ s. d.
Administration:		
Payment of Council	1,000 0 0	
Secretary	800 0 0	
Salaries and wages	742 10 0	
Rent, fuel, and lighting	713 17 7	
Furniture and fittings	84 9 8	
Incidental and contingent expenses	447 3 8	
Expenses contingent on Meteorological Congress	5 11 3	
Pensions	42 16 4	
		3,836 8 6
Special Researches:		
Actinometry	7 17 6	
Arctic work	25 16 0	
Barometer Manual	10 10 0	
Bridled anemometer	11 8 2	
Clouds	13 12 5	
Harmonic analysis	114 4 0	
Meteorological Atlas	6 1 3	
Scilly anemometer	6 19 7	
Scottish Meteorological Society	100 0 0	
Sunshine cards	27 6 10	
Synchronous observations (N. Atlantic)	362 13 4	
		686 9 1
Land Meteorology:		
Observatories and stations	2,433 4 10	
Discussion and reduction of observations	1,299 14 1	
		3,732 18 11
Weather Information and Forecasts:		
Telegraphic reports and storm warnings	3,233 1 7	
Preparation and issue of reports and forecasts	1,474 9 0	
		4,707 10 7
Inspections:		
Salaries and travelling expenses		525 8 5
Ocean Meteorology:		
Discussion and reduction of observations	1,756 19 6	
Expenses incidental to the supply of instruments:		
Proportion for care and issue of instruments	200 0 0	
Royal Navy	224 16 11	
Mercantile Marine	606 1 9	
Distant island and coast stations	32 11 0	
		2,820 9 2
Balance		820 10 11
		£17,129 15 7

Liabilities.	£ s. d.
To sundry creditors	863 0 7
„ balance	820 10 11
	£1,683 11 6

Assets.	£ s. d.
By cash at Bank	1,310 12 1
„ „ at Office	87 5 6
„ „ at Valencia	50 0 0
„ sundry debtors	235 13 11
	£1,683 11 6

116, *Victoria Street, May* 21, 1884.

PRESENT:

LIEUT.-GENERAL STRACHEY IN THE CHAIR.

MR. DE LA RUE.	MR. STONE.
MR. GALTON.	THE HYDROGRAPHER.

The Secretary was in attendance.

The Minutes of the last meeting (May 7) were read and confirmed.

Mr. Scott submitted the following correspondence (see Minutes, p. 1) :—

(M.O. 900.) Meteorological Office, 116, Victoria Street, S.W.,
April 14, 1884.

DEAR SIR,

I HAVE just received a letter (No. 900) from Mr. Omond at Ben Nevis, containing the following passage: "I have been instructed by the Directors in future to send these telegrams " the day after the changes recorded in them occur. That is, you will receive in the course of " the forenoon an account of the previous day's observations." I have to ask if this is correct, as it entirely destroys the value of telegraphic reports from that station to this Office.

Yours, &c.
(Signed) ROBERT H. SCOTT,
Secretary.

A. Buchan, Esq., F.R.S.E.

(M.O. 900.) Meteorological Office, 116, Victoria Street, S.W.,
May 2, 1884.

DEAR SIR,

I AM instructed by the Chairman to remind you that I have as yet received no reply to my letter of the 14th ultimo, relative to the arrangements for supply of telegraphic reports from Ben Nevis. I am to request an early answer, as the matter must come before the Council on the 7th instant.

Yours, &c.
(Signed) ROBERT H. SCOTT,
Secretary.

A. Buchan, Esq., F.R.S.E.

(M.O. 1125.) Chambers of the Scottish Meteorological Society,
122, George Street, Edinburgh,
May 14, 1884.

SIR,

YOUR letters of 31st March, 14th April, and 2nd May have been submitted to the Directors of the Ben Nevis Observatory.

With reference to your letter of 31st March, I am instructed to convey the thanks of the Directors to the Meteorological Council for the contribution of 100*l.* to the Observatory for the year ended 31st March 1884.

In your letter of 14th April, you say that you have received a letter from Mr. Omond, the Superintendent of the Observatory, containing the following passage —

> "I have been instructed by the Directors in future to send these telegrams the day after the changes recorded in them occur, that is, you will receive in the course of the forenoon an account of the previous day's observations ;"

and, in regard to this passage, you ask if it is correct.

In answer, I am desired to inform you that on 29th March the Directors telegraphed to Mr. Omond as follows :—

> " Be careful not to send telegrams to Meteorological Office which might anticipate by publication the information sent to Press Association."

The instruction in this telegram was sent to Mr. Omond in consequence of representations from the Press Association, to the effect that telegraphic weather reports from Ben Nevis were occasionally published by the Meteorological Office in anticipation of the daily report sent to the Press Association under an agreement with the Directors, the terms of which are as follows :—

> " If the proposed agreement be concluded, the Press Association will have the exclusive use for publication of the information sent to it,—in other words, there will be no other channel of communicating daily reports from the Observatory to the newspaper press either in this or any other country.
>
> " It has been arranged with the Meteorological Office, in London, that detailed copies of the hourly observations made on Ben Nevis shall be forwarded to it regularly as they are received at the Office of the Society here. This, in practice, will mean a despatch at intervals varying from two to six weeks. No daily telegraphic report is sent from the Observatory to the

London Meteorological Office, but a wish has been expressed that the Superintendent of the Observatory should use his discretion in telegraphing to the London Meteorological Office any striking change of conditions or special phenomenon of great interest. It is understood, however, that such information as may thus be occasionally given will be for use in scientific work and not for immediate publication, and the daily publication of the report sent to the Association will not in this way be even occasionally anticipated."

Before entering into negotiations with the Press Association, the Directors had written as follows to the Meteorological Council:—

"If the Meteorological Council desire the observations at any of these hours sent by telegraph to their Office, the Directors will give instructions to Mr. Omond, Superintendent of the Observatory, and to Mr. Livingstone (Fort William) to forward regularly the information required."

It thus appears that the Directors, immediately after the erection of the Observatory, offered the Council full and immediate use of the information collected by the observers on Ben Nevis.

The Meteorological Council, however, after considering the offer, wrote as follows:—

"We do not at present wish for regular telegrams. The cost of three a day from Ben Nevis and Fort William would be about 120*l.* a year, and as we do not see how exactly to use them from day to day, we wish to wait till at least your (*i.e. Mr. Buchan's*) results have been published. However, we should wish Mr. Omond to use his own discretion and telegraph to us whenever any very striking change of conditions, or a special phenomenon of great interest, is recorded. No regular rules can be laid down for such a service; we must only try it, and see what we can get out of it. He may be somewhat liberal in telegraphing at first at least."

The offer of the Directors to transmit observations from Ben Nevis daily by telegraph was thus declined for the present by the Council. With reference to the occasional observations which Mr. Omond was asked to send, the Directors gave their consent to the Council's request; but they understood that such observations were to be scientifically studied with the view of finding out how far, or in what way, they could be made useful in weather forecasting, and whether it would eventually be desirable to have observations forwarded daily by telegraph. There is nothing in the letter from the Council to show that they contemplated the immediate publication, in a bare form, of observations from Ben Nevis transmitted at irregular intervals and at the discretion of Mr. Omond. The letter does not even indicate that the Council meant to publish the inferences arrived at through the aid of such occasional information regarding exceptional phenomena on Ben Nevis. The Council were only to try and see what they could get out of it.

The Directors, therefore, had no hesitation in entertaining proposals made to them by several newspapers to purchase daily weather reports from Ben Nevis. Ultimately these proposals, for the sake of convenience, took the shape of an agreement with the Press Association, which lasts to the end of the present year. For the daily weather reports thus supplied to the Association, the Directors are paid at the rate of 100*l.* per annum.

The Meteorological Council are aware that a large sum of money obtained by subscription from the public has been spent in building and equipping the Observatory, and that a large sum will be required annually to carry it on. They are also aware that the Directors receive no aid from Government, and that the Observatory is not endowed. They must see, therefore, that it was the duty of the Directors, in the circumstances, not to lose the opportunity of adding to their resources by the supply of a daily report to the public through the Press.

The first object which the Directors have in view, is to make the Ben Nevis Observatory useful in scientific work. For this end they are prepared to make considerable sacrifices. They are prepared to do their best, for instance, in spite of the smallness of their staff, to supply information at a trifling charge, or if necessary without any charge, to qualified persons, who are earnestly prosecuting the study of meteorology, and who are not in a position to make adequate, or to make any payment. But they cannot regard in this light a body like the Meteorological Council, which receives yearly for the prosecution of its work nearly 15,000*l.* from the State. The Directors accordingly beg to represent to the Council that, if the Ben Nevis observations are of value in the work entrusted to the Council by the country—whether that work has reference to the study of meteorology broadly, or specially to the framing of weather forecasts—such a payment should be made for the observations as would give substantial assistance in carrying on the observatory. If, on the other hand, the Ben Nevis observations are of no value to the Council in regard to any of their work —a thing which seems impossible—the Directors are ready to relinquish the promised annual contribution from the Council towards the expenses of the Observatory.

The Meteorological Council rendered an important service to Meteorology in 1879 in resolving that they—

"are willing to contribute 100*l.* a year towards the annual expenses of an Observatory on Ben Nevis, provided funds can be obtained for the erection of the building, and that copies of the observations be regularly communicated to the Meteorological Office."

The building was erected last year; and the Council, on being informed of this, repeated and confirmed their resolution of 1879, intimating to the Directors of the Observatory, who consist of the Council of the Scottish Meteorological Society and three gentlemen nominated by the Royal Societies of London and Edinburgh, that they

"will allow the 100*l.* for the current year, and of course for the future while the Observatory goes on, only subject to the Government paying our [*their*] grant."

The Directors are indebted to the Meteorological Council for thus engaging to assist them in the heavy work they have undertaken by a permanent conditional grant of 100*l.* annually.

The fact that this support had been promised is believed to have encouraged many persons to subscribe to the fund for the building of the Observatory.

The conditions of the engagement with the Society in 1879 were that funds should be provided for the erection of a building, and that copies of the observations should be regularly communicated to the Meteorological Office. The conditions of the later engagement with the Directors in 1883 were that the Observatory should go on, and that the Council should continue to receive its grant from the Government. All these conditions have been implemented; and the Directors must therefore presume that the qualification or limitation of the engagement, which is implied in paragraphs of the Council's letters of 23rd February and 31st March 1884, is due to momentary forgetfulness of the terms of their resolutions just quoted. The paragraph in the first letter referred to is as follows :—

> " It is, of course, understood that for the contribution we make to the Observatory, we are at liberty to receive and publish any telegraphic information we may from time to time request Mr. Omond to forward."

Besides being a qualification of the engagement, this intimates, as an understanding of the Council, that the Superintendent of the Observatory is to take instructions directly from them, an arrangement to which the Directors could not possibly agree. The paragraph of the second letter referred to goes further. It is as follows :—

> " But they [*the Council*] must distinctly state that the continuance of their contribution in the future must depend on their receiving, for publication, in any manner they think most suitable, such information from the Observatory as they may from time to time require for the preparation of the Daily Forecasts or Weather Reports."

When this was written, the Directors believe that the terms of the resolutions of 17th February 1879 and 3rd December 1883 must have escaped recollection.

The Directors themselves are satisfied as to the importance of the information obtained at the Ben Nevis Observatory; and, having only in view (1) its value and (2) the cost of collecting it, they think that the annual contribution from the Council should be increased. But they desire to point out that, if the supplying of information to the Council were to deprive the Directors of a source of income, there is clearly a reason the more for giving an increase of the Council's contribution.

The Directors hope that the Council will see the force and fairness of the views now submitted, and they beg to say that it seems to them only right that the annual contribution from the Council should be increased to 300*l*. In return for this the Directors would endeavour to supply the Meteorological Office with such information from the Observatory as might be asked in the quickest way available.

It is, perhaps, important to point out that this would imply no change in the management of the Observatory. The observers would continue to take their instructions from the Directors—the officials of the Council only communicating with them directly, when explanations of transmitted observations were needed. From an administrative, and from every other point of view, the propriety of this arrangement seems beyond question. Among its other advantages, it tends to prevent misunderstanding; as, for example, in the case of a communication from the Meteorological Office to Mr. Omond, of 15th February 1884, in which this passage occurs :—

> " Of course the Press Circular is utterly ludicrous, for if it is not withdrawn, it is a breach of contract with this Office on the part of your Directors."

Statements of this kind not only tend to create misunderstanding, but also to give offence, though they may not be designed to do so; and the Directors think that they are less likely to occur in communications to headquarters than in less restrained communications to officials.

I am directed to repeat here what was said in the letter to the Council from the Directors, of 19th March 1884, namely, that—

> " Although the Press Association have the right for the rest of this year to the exclusive publication of a daily weather report, of the limited character mentioned above, the Directors do not see why the Meteorological Office may not, even this year, be furnished with a daily weather report direct from the observatory—not for immediate publication, but for use in the Office."

The reason why the Directors desire me to repeat this is to make it plain that, so far as scientific work goes (inclusive of the bearing of the observations on forecasting), the Meteorological Council, even during the currency of the agreement with the Press Association, may, if they so wish, be put in possession of the Ben Nevis observations, on the understanding that such observations shall not be immediately published in their bare form, though inferences to which they may have contributed in forecasting may at once be published.

The Directors have though it proper to bring their views fully before the Council, and they trust that what they have said will be carefully considered, because they feel that the Council do not correctly understand their position and claims. They beg, in conclusion, to intimate that they are ready to appoint a deputation to confer with the Council on the future relations between them and the Council.

With this in prospect, the Directors have thought it desirable to put this letter into type, so that a copy of it may be sent to each member of the Council.

I am, &c.

(Signed) ALEXANDER BUCHAN,
Secretary

To Robert H. Scott, Esq., Secretary,
Meteorological Office,
116, Victoria Street, London, S.W.

SUBMITTED—The following STATEMENT respecting the RECORDS for September 1882, received from the SELF-RECORDING OBSERVATORIES (see Minutes, 21st December 1868 and 20th November 1876).

—	Aberdeen.		Armagh.		Falmouth.		Glasgow.		Kew.		Stonyhurst.		Valencia.	
ANEMOGRAPH :—	Direction. Good.	Velocity. Good.	Direction. Good.	Velocity. Good.	Direction. Good.	Velocity. Good.	Direction. Good.	Velocity. Good.	Direction. Good.	Velocity. Good.	Direction. Good.	Velocity. Good.	Direction. Good.	Velocity. Good.
Action - - - - - -														
Records deficient, due to stoppage of clock -	0	0	0	0	0	0	0	0	0	0	0	0	0	0
„ „ other causes - -	*7	*8	*4	*5	*5 †17	*5 †17	0	0	‡2	0	‡1	0	*3	*3
Orientation verified - - - -	—	—	—	—	9th	—	2nd 30th	—	15th	—	18th	—	13th 20th	—
No. of errors discovered by subsidiaries -	0	0	0	0	0	0	10	0	0	0	0	0	0	0
„ „ irregular differences -	0	0	2	3	1	0	0	3	29	0	5	0	1	11
Result of 40 *Remeasurements* :—														
Greatest difference - - - -	1·0	1·0	0·0	1·0	0·0	1·0	0·0	1·0	1·0	1·0	2·0	1·0	1·0	2·0
Mean difference irrespective of sign - -	0·0	0·3	0·0	0·2	0·0	0·4	0·0	0·4	0·0	0·2	0·1	0·3	0·0	0·7
Residual difference (—Meteorological Office) -	0·0	0·0	0·0	0·0	0·0	—0·2	0·0	—0·2	0·0	+0·1	+0·1	—0·2	0·0	—0·1
RAIN GAUGE :—														
Action - - - - - -	Good.		Good.		Good.		Good.		Good.		Good.		Good.	
Records deficient, due to stoppage of clock -	0		2		0		0		0		0		0	
„ „ other causes - -	0		0		0		0		0		0		0	
Errors in tabulation - - - -	0		1		1		6		2		2		0	

BAROGRAPH :—							
Action - - - - - -	Good. Indifferent.	Good. Do.	Good. Do.	Good. Indifferent.	Good. Do.	Good. Do.	Good. Do.
Photography - - - -							
Records deficient, due to stoppage of clock -	0	0	0	0	0	0	0
„ „ failure of light -	0	0	0	0	0	2	0
„ „ other causes - -	0	0	*1 §2	0	¶10	0	0
No. of errors discovered—							
In entry of standard - - -	3	2	1	3	6	7	0
„ calculating residual correction - -	0	0	4	4	6	2	0
„ applying residual correction - -	0	9	0	4	2	5	0
„ subtraction in subsidiary tables -	0	0	2	2	0	4	0
„ tabulation by subsidiaries - -	0	0	0	0	0	0	0
„ „ irregular differences -	0	0	0	1	2	1	1
Result of 40 Remeasurements :—							
Greatest difference - - - -	0·005	0·005	0·005	0·005	0·005	0·005	0·005
Mean difference irrespective of sign - -	0·002	0·002	0·003	0·002	0·002	0·002	0·002
Residual difference (— Meteorological Office) -	0·000	0·000	0·000	0·000	0·000	−0·001	0·000
Mean monthly difference between simultaneous barograph and barometer readings - -	0·002	0·002	0·001	0·002	0·002	0·001	0·002

THERMOGRAPH :—																
Action - - - - -	Good. Do.		Good. Do.		Good. Do.		Good. Indifferent.		Good. Indifferent.		Good. Do.		Good. Do.	
Photography - - - - -																
	Dry.	Wet.	Dry.	Wet.	Dry.	Wet.	Dry.	Wet.	Dry.	Wet.	Dry.	Wet.	Dry.	Wet.		
Records deficient, due to stoppage of clock -	0	0	0	0	0	0	0	0	0	0	10	10	2	2		
„ „ failure of light - -	0	0	0	0	0	0	0	0	0	0	0	0	0	0		
„ „ imperfectly moistened bulbs - -	—	0	—	0	—	0	—	0	—	0	—	8	—	0		
„ „ partially frozen bulbs -	—	0	—	0	—	0	—	0	—	0	—	0	—	0		
„ „ other causes - -	0	0	0	0	*2 §2	*2 §2	*1	*2	0	0	0	0	0	0		
No. of errors discovered in entry of standard -	0	0	1	5	0	0	0	0	0	1	6	4	0	1		
„ „ by subsidiary measurements -	0	0	0	0	0	0	0	0	0	0	0	0	0	0		
„ „ of subtraction in do. tables -	1	0	0	0	1	0	0	1	5	7	2	2	2	1		
„ „ detected under glass scale -	0	0	0	0	0	0	1	0	1	1	2	0	0	0		
Result of 40 Remeasurements :—																
Greatest difference - - - -	0·2	0·2	0·2	0·2	0·2	0·2	0·3	0·2	0·2	0·3	0·2	0·3	0·3	0·2		
Mean difference irrespective of sign - -	0·1	0·1	0·1	0·1	0·1	0·1	0·1	0·1	0·1	0·1	0·1	0·1	0·1	0·1		
Residual difference (— Meteorological Office) -	0·0	0·0	0·0	0·0	0·0	−0·1	0·0	0·0	0·0	0·0	−0·1	0·0	0·0	0·0		
Mean monthly difference between simultaneous thermograph and thermometer readings -	0·1	0·1	0·1	0·2	0·1	0·1	0·1	0·1	0·2	0·2	0·1	0·2	0·1	0·2		
No. of errors in maxima and minima - -	1	—	4	—	5	—	0	—	2	—	5	—	3	—		

* Cleansing or examining instrument. † Cylinder not clamped. ‡ Trace lost. § Visitors. ¶ Shutter stopped clock.

The GLASGOW *Anemograms*, APRIL—SEPTEMBER, 1882, were re-tabulated before examination, in consequence of the incorrectness of the measurements.

The STONYHURST *Anemograms* have been re-tabulated owing to bad attachment of curve.

SUBMITTED—The following STATEMENT respecting the RECORDS for October 1882, received from the SELF-RECORDING OBSERVATORIES (see Minutes, 21st December 1868 and 20th November 1876).

	Aberdeen.		Armagh.		Falmouth.		Glasgow.		Kew.		Stonyhurst.		Valencia.	
ANEMOGRAPH:—	Direction.	Velocity.	Direction.	Velocity.	Direction.	Velocity.	Direction.	Velocity.	Direction.	Velocity.	Direction.	Velocity.	Direction.	Velocity.
Action	Good.	Good.	Good.	Good.	Good.	Good.	Good.	Good.	Good.	Good.	Good.	Good.	Good.	Good.
Records deficient, due to stoppage of clock	0	0	0	0	0	0	0	0	0	0	0	0	0	0
„ „ other causes	0	0	0	0	*1 hr.	*1 hr.	†6 hrs.	†6 hrs.	0	0	†3 hrs. §4 hrs. ‡1 hr.	†4 hrs. §6 hrs. ‡3 hrs.	0	0
Orientation verified	21st	—	25th	—	12th	—	28th	—	10th	—	23rd	—	16th	—
No. of errors discovered by subsidiaries	0	0	0	0	0	0	0	0	0	0	0	0	0	0
„ „ irregular differences	0	0	0	0	1	1	13	18	0	0	0	2	0	4
Result of 40 *Remeasurements*:—														
Greatest difference	0·0	1·0	0·0	1·0	0·0	2·0	1·0	1·0	0·0	1·0	0·0	1·0	0·0	1·0
Mean difference irrespective of sign	0·0	0·5	0·0	0·3	0·0	0·6	0·1	0·4	0·0	0·5	0·0	0·6	0·0	0·4
Residual difference (— Meteorological Office)	0·0	−0·3	0·0	0·0	0·0	0·0	0·0	0·0	0·0	0·0	0·0	0·0	0·0	+0·1
RAIN GAUGE:—														
Action	Good.		Good.		Good.		Good.		Good.		Good.		Good.	
Records deficient, due to stoppage of clock	0		0		0		0		0		0		0	
„ „ other causes	0		0		0		0		0		0		0	
Errors in tabulation	0		0		3		13		0		7		0	

BAROGRAPH :—

Action - - - - - -	Good.	Good.	Good.	Good.	Good.	Good.	Good.
Photography - - - - -	Do	Do.	Do.	Do.	Do.	Do.	Do.
Records deficient, due to stoppage of clock -	0	0	0	0	6 hrs.	0	0
,, ,, failure of light -	0	0	0	0	0	0	1 hr.
,, ,, other causes - -	¶1 hr.	0	0	†1 hr.	0	†1 hr.	0
No. of errors discovered—							
In entry of standard - - -	1	0	0	0	4	3	1
,, calculating residual correction -	0	0	3	6	1	1	1
,, applying residual correction - -	1	1	0	2	1	1	1
,, subtraction in subsidiary tables -	0	0	0	1	2	2	3
,, tabulation by subsidiaries - -	0		0	0	0	0	0
,, ,, irregular differences -	0	0	1	0	0	0	0
Result of 40 *Remeasurements* :—							
Greatest difference - - - -	·005	·005	·006	·005	·005	·006	·006
Mean difference irrespective of sign - -	·001	·002	·002	·002	·001	·003	·002
Residual difference (—Meteorological Office) -	+·001	·000	—·001	+·001	·000	+·001	·000
Mean monthly difference between simultaneous barograph and barometer readings - -	·001	·002	·001	·002	·002	·001	·002

THERMOGRAPH :—

Action - - - - - -	Good.		Good.		Good.		Good.		Good.		Good.		Good.	
Photography - - - - -	Do.		Do.		Do.		Do.		Very good.		Do.		Do.	
	Dry.	Wet.	Dry.	Wet.	Dry.	Wet.	Dry.	Wet.	Dry.	Wet.	Dry.	Wet.	Dry.	Wet.
Records deficient, due to stoppage of clock -	0	0	0	0	0	0	0	0	0	0	0	0	0	0
,, ,, failure of light -	0	0	0	0	0	0	0	0	0	0	0	0	0	0
,, ,, imperfectly moistened bulbs - -	—	0	—	2 hrs.	—	0	—	1 hr.	—	7 hrs.	—	1 hr.	—	0
,, ,, partially frozen bulbs -	—	0	—	0	—	0	—	1 hr.	—	0	—	0	—	0
,, ,, other causes - -	¶1 hr.	¶1 hr.	0	0	0	0	†3 hrs.	†3 hrs.	0	0	0	0	0	0
No. of errors discovered in entry of standard -	0	0	0	0	2	1	2	0	4	0	5	8	0	0
,, ,, by subsidiary measurements -	0	0	0	0	0	0	0	0	0	0	0	0	0	0
,, ,, of subtraction in do. tables -	0	2	0	1	2	0	1	1	5	5	1	1	0	0
,, ,, detected under glass scale -	0	0	0	0	1	1	1	0	0	0	0	1	4	3
Result of 40 *Remeasurements* :—														
Greatest difference - - - -	0·2	0·2	0·2	0·2	0·3	0·2	0·2	0·2	0·2	0·2	0·2	0·3	0·3	0·3
Mean difference irrespective of sign - -	0·1	0·1	0·1	0·1	0·1	0·1	0·1	0·1	0·1	0·1	0·1	0·1	0·1	0·1
Residual difference (—Meteorological Office) -	0·0	0·0	+0·1	+0·1	0·0	0·0	0·0	—0·1	0·0	—0·1	0·0	+0·1	+0·1	+0·1
Mean monthly difference between simultaneous thermograph and thermometer readings -	0·1	0·1	0·1	0·2	0·1	0·1	0·3	0·2	0·2	0·2	0·1	0·1	0·2	0·2
No. of errors in maxima and minima - -	1	—	4	—	4	—	1	—	1	—	4	—	6	—

* Pencils not lowered. † Instrument under examination. § Adjustment of time indicator. ‡ Cylinder not sufficiently clamped. ¶ Changing curves.

Mr. Scott reported that, having on the 13th instant received a telegram from Ben Nevis referring to the weather of the previous day, he had at once written to Mr. Buchan as follows:—

(M.O. 1101.)

Meteorological Office, 116, Victoria Street, S.W.,
May 13, 1884.

DEAR SIR,

WE received yesterday a long telegram from Mr. Omond referring to the *two previous days*. I shall be obliged if you will give directions for such late telegrams to be discontinued, as they cause a useless expense to this Office. The information could be sent by post.

Yours, &c.
(Signed) ROBERT H. SCOTT,
Secretary.

A. Buchan, Esq.,
Secretary, Scottish Meteorological Society.

The consideration of this subject was adjourned to next meeting.

Read—The following letter (Minutes, 1883, p. 33):—

(M.O. 1100.)

Scottish Meteorological Society,
Edinburgh, May 10, 1884.

DEAR SIR,

I AM requested by the Council to say that the cost of supplying copies of the monthly schedules of observations from the Society's five stations will be at the uniform rate of five shillings each monthly sheet, this sum covering the expenses incurred in copying, verifying, and collating. The sum has been fixed by the average time required in doing the work.

(Signed) ALEXANDER BUCHAN.

R. H. Scott, Esq.

Mr. Scott was instructed to accept the terms proposed (P.C. 1,136).

Submitted—The following report:—

I HAVE the honour to report that on the 15th instant I went to Dungeness, taking with me the instruments required for the establishment of the telegraphic reporting station at that point. I found the locality very well suited for the purpose, as the point is very low, and there is, for the distance of several miles, no hill which could affect the wind.

The principal lightkeeper, Mr. Lloyd, seems intelligent, and has already had considerable experience in weather reporting for the Trinity House.

The barometers are erected in his house, the thermometer screen in his garden, and the rain gauge at a little distance from the buildings.

The telegraphic wires have been carried to the signal station, situated in the Redoubt, distant more than a quarter of a mile from the lighthouse. It will be necessary to make some provision for a messenger to carry the reports to the telegraph office. I understand from Mr. Lloyd that this service could be performed for 1*s.* weekly, and I recommend that this allowance be made. As soon as the reports are quite satisfactory, the station will be substituted for Dover.

I have further to report that the instruments for Belmullet reached that station safely on the 17th instant, and that the observer, Mr. R. Gibbons, is now being trained in the duty of reporting.

(Signed) ROBERT H. SCOTT.

Read—A memorandum from Captain Toynbee reporting that since the last meeting 13 logs had been received, 7 of them being "excellent."

Observer.	Ship.	Period.	Voyage.	Last mention on Minutes.
Capt. Jas. Buchan -	Barque "Coppename."	Nov. 10, 1883—May 13, 1884.	London, Surinam, Greenock.	1883, p. 54.
Capt. W. R. Cato, R. Ladd, Esq., F.R. Met. Soc.	S.S. "Scotia" -	Mar. 11—May 10, 1884.	London to St. Vincent and home, then Bilbao and home, laying cables.	1883, p. 90.
Capt. H. Manning -	S.S. "Seine" -	Dec. 23, 1883—May 15, 1884.	Port Darwin, cable laying	1882, p. 63.
Capt. T. Moffatt -	"Westland" -	Aug. 12, 1883—May 1, 1884.	London, New Zealand, and home.	—
Lieut. Com. W. U. Moore, R.N., Lieut. S. V. S. C. Messum, R.N.	H.M.S. "Dart"	Dec. 20, 1883—Mar. 21, 1884.	Australian Station -	1883, p. 136. Lieut. Moore.
Capt. D. Steven -	"Inch Keith" -	Aug. 6, 1883—Mar. 17, 1884.	London, Calcutta, and home.	1883, p. 38.
Capt. W. J. L. Wharton, R.N.	H.M.S. "Sylvia"	Aug. 31, 1882—Mar. 17, 1884.	Rio and Straits of Magellan.	1883, p. 117.

Mr. Scott was instructed to present the charts (O. 27) to Captain Moffatt and Lieutenant Messum, and to convey the best thanks of the Council to the other observers.

Submitted—The following report (Minutes, 1882, p. 102) :—

SIR, May 21, 1884.

WITH respect to your wish that I should state, for the information of the Council, the time necessary for drawing up a short meteorological summary of the balloon ascents which have hitherto been made, I beg to state that, in my opinion, the ascents made by Messrs. Welsh and Glaisher, in connexion with the British Association, are the chief that contain meteorological observations of really scientific value. The style of observations made was indicated in my report, dated February 24th, 1883, pp. 3 to 9.

I most respectfully submit that little short of a continuation of the discussion of the observations above referred to would convey any adequate idea of the results obtained, and possibly this would yield but a poor return for any outlay. I am, however, of opinion that for the cost of 5*l.* a short summary might be given, but if a more elaborate summary than that sketched out above is required, it would considerably increase the cost, and the whole state of balloon observations is so indefinite that I should not like to say that any very satisfactory results would be obtained.

(Signed) CHAS. HARDING.

R. H. Scott, Esq., F.R.S.

Mr. Scott was instructed to have an abstract of the results of Mr. Glaisher's ascents prepared by Mr. C. Harding, on the form suggested by him.

Reported—That Dr. Ferrari, of the Central Meteorological Office, Rome, had applied (Letter 1090) for permission to publish a translation into Italian of the "Barometer Manual for Seamen," and that a reply had been sent to him (P.C. 1053) in the same terms as that to M. von Freeden (Minutes, p. 7).

Reported—That a letter had been received from the Treasury (M.O. 1183), asking if the Office could supply "a Return of the storms which have visited the British "Islands between 1st January 1874 and 31st December 1883, and of which no "warning has been issued by the Meteorological Office; with a notice of the quarter "from which each unwarned storm has reached the coast," as moved for in the House of Lords by the Lord Bishop of Carlisle.

A reply had been sent (P.C. 1164) stating that such a Return could be furnished if required.—Approved.

Mr. Scott was instructed to make arrangements for the issue of Hay Harvest Forecasts in the coming summer, as in former years.

116, *Victoria Street, June* 11, 1884.

PRESENT:

LIEUT.-GENERAL STRACHEY IN THE CHAIR.

MR. DE LA RUE. | PROFESSOR STOKES.
MR. GALTON. | MR. STONE.
THE HYDROGRAPHER.

The Secretary was in attendance.

The Minutes of the last meeting (May 21) were read and confirmed.

The revised draft of the Report for the year 1883–4 was considered and approved, and the Chairman was requested to forward it to the Royal Society (P.C. 1332).

Read—A letter (No. 1218) from the Admiral Superintendent of Naval Reserves, forwarding, "for the consideration of the Meteorological Council," a letter from Rear-Admiral R. Gordon Douglas, recommending that the officers of cruisers, on fishing grounds, should hoist cones when they expected the approach of storms.

Mr. Scott was instructed to reply (P.C. 1360) that the issue of instructions to the officers must rest with the Admiralty; but that the Council could not sanction the use of the cone, and were not of opinion that the officers of cruisers would often be in a position to issue useful warnings.

The Chairman submitted the following statement received from Mr. Buchan:—

STATEMENT.

(M.O. 1349.) Scottish Meteorological Society, 122, George Street, Edinburgh, May 26, 1884.

In the summer of 1883, the Council of this Society received an application from the Meteorological Council for copies of daily observations from five of their stations. This request was acceded to.

The Meteorological Council would have preferred the individual observations to have been corrected for instrumental errors, and the barometric observations reduced to 32° and sea level, and the ordinary hygrometric deductions made; but as there is no staff in this office, and as the sum allowed for the five stations would be insufficient to maintain a clerk, simple copies of the observations alone have been forwarded.

As the Meteorological Council are perhaps aware, this Society* has for a number of years given some attention at irregular intervals to detect in the schedules of their observers such barometric errors as 0·100 inch and 0·050 inch, which, as is well known, even the best observer without exception sometimes make, and by communications, personally or by letter, with the observers, has endeavoured to reduce the cases of occurrence of these errors at their stations.

While it has been the practice to correct errors of 1·000 inch and 0·500 inch, and obvious inversions of figures in the Society's schedules, errors of 0·100 inch and 0·050 inch have not yet been systematically searched for and corrected. A considerable number of these errors have, however, been marked on the schedules, viz., such of them as from some cause or other happened to be noticed.

As the number of the Society's stations is sufficiently large (see map of stations enclosed) for the detection of these errors in nearly every case, they have been corrected in the individual observations hitherto published by the Society. On the other hand, as regards the observations from which monthly means have been deduced, no corrections have been made for errors of tenths and half tenths. The search for and corrections of these errors systematically carried out, raise several questions on which my Council has not yet come to a resolution.

The copies of observations already sent from the five stations include the whole of 1880 and part of 1883; and in these copies the errors referred to were not corrected. Lists of apparent errors for each month from January to June 1880 have from time to time been received from the Meteorological Office for examination, and rectification wherever necessary.

In the end of January last it was intimated that observations from more of the Society's stations would be asked for; and in April a proposal was made to correct all apparent errors in the Meteorological Office without communicating with the Society. As regards the latter proposal we preferred that the errors be inquired into and corrected in this office.

On May 5, Mr. Scott sent me a letter in which the following paragraph occurs:—

"Can nothing be done to improve the returns you send us for printing. *Literally* (sic) if they "did not come from the Scottish Meteorological Society we should reject them in toto, and so "would the Royal Meteorological Society. The observations are bad." The letter was sent not to this office, but to my private residence.

A week thereafter the schedules containing the errors for June 1880 were received from the Meteorological Office. Now it is to these lists of errors in their relation to the above paragraph that I have to ask your attention. I confine my remarks to the barometric observations.

---

* Proceedings of Meteorological Congress at Vienna.—Evidence before Scientific Commission.

These errors I have examined with care, comparing them with the observations made at the same dates at the Society's other stations. The result of the comparison as regards each of the stations is as follows :—

	Number of Errors pointed out by Meteorological Office.	Times Observer was right.	Number of Times the Meteorological Office was		
			Right.	Wrong.	
Dunrobin - -	3	1	1	1	Third case is doubtful.
Braemar - -	16	13	2	14	In one case Meteorological Office suggests error of 0·100 intead of 0·050 inch.
Dundee - -	1	1	0	1	Att. thermometer only in error.
Rothesay - -	3	3	0	3	
Pinmore* - -	5	0	4	1	In one case, error of 0·200 was suggested instead of 0·150 inch.
Total	28	18	7	20	

* This observer only began in May to observe.

If the Meteorological Office had gone to press without communicating with this office, for every error they had succeeded in taking out of that month's observations, three new errors would have been introduced ; and if the observations had been asterisked and footnoted in the printed sheets of the observations at stations of the second order, Mr. Scott's criticism of the observations of these five stations could not have been regarded as altogether uncalled for.

It may be added that the observations at Tillyprouie (1,120 feet high), and at other stations within 50 miles of Braemar concur in showing that the observation at Braemar at 9 p.m. of the 23rd, which is entered in the schedule at 28 · 587 inches should have been 28 · 537 inches. This error of 0 · 050 inch too high the Meteorological Office has not pointed out.

I should not be surprised if it turns out on inquiry that the faulty method of collating observations indicated by the list of errors sent from the Meteorological Office has arisen by neglecting to take into consideration the meteorological conditions which accompany local weather, and by the way in which the individual observations at all stations, including the more elevated stations, are reduced to sea level,—a hard-and-fast method being apparently practised which allows the merest computer to do the work, and calls for no expert to weigh the bearing of, say, a rapid increase of the temperature on the readings of the instrument itself, and on the pressure, &c. of the free atmosphere. In this connexion, the reduction to sea level of the Braemar 9 a.m. observation of the 25th June might be examined, and how therefrom the inference was drawn that the observer had made a mistake in reading his barometer 0 · 050 inch too low.

As the chief value of the daily observations published by the Meteorological Council is to contribute to the exact study of weather,—particularly local weather from day to day,—it is essential that the observations be accurately given; and to secure this end, so far as possible, that no corrections are applied unless supported by the clearest evidence. It is in every way preferable in all cases of doubt to leave the *onus* of correcting to the specialist, who may have occasion to use the observations.

If the same system of collating has been applied by the Meteorological Office to the English and Irish stations that has been applied to this Society's five stations for June 1880, it is not improbable that not a few of the barometric observations, during at least the prevalence of certain types of weather, are inaccurate and misleading.

The whole subject is so serious that the Meteorological Council might consider whether it may not be desirable to collect from the Meteorological Office and from the Royal Meteorological Society all the instances referring to 1880 in which the observations of the observers have been corrected, together with the original observations themselves. It might then be seen how far their just weight, and no more, has been given to the isobars of daily weather maps, and generally how far the corrections made on the original observations are warranted.

ALEXANDER BUCHAN.

Mr. Scott submitted the following Memorandum :—

MEMORANDUM.

The expression to which Mr. Buchan refers was based upon the observations of the months of 1880 prior to June, to which month alone his remarks apply.

My letter to him was dated May 5. The letters relating to the month of June bore date May 12. In the letter of that date, referring to Braemar, the Office used the following words :—

"Is it not likely that the height of the station (1,114 feet) may explain some of these apparent "discrepancies ?"

Mr. Buchan does not mention this suggestion, but he adopts it. He has not alluded to the returns for the months previous to June.

I now submit, for the information of the Council, a table showing the number of queries on the returns for the six months, January to June, 1880, sent to Mr. Buchan, with the number of cases in which alterations have been made by him after comparison with the observations at neighbouring stations, &c.:—

Station and Month.	Barometer.								Temperatures, &c.	
	Queries sent to Mr. Buchan.				Alterations made by Mr. Buchan.				Number of Queries sent to Mr. Buchan.	Number of Alterations made by Mr. Buchan.
	Total.	Of ·050 in.	Of ·100 in.	Above ·100 in.	Total.	Of ·050 in.	Of ·100 in.	Above ·100 in.		
Braemar:										
January	2	—	—	2	2	—	—	2	2	2
February	—	—	—	—	—	—	—	—	2	2
March	1	—	1	—	1	—	1	—	2	2
April	4	—	4	—	3	—	3	—	—	—
May	10	5	4	1	6	2	4	0	2	2
June	16	12	4	—	3	1	2	—	2	2
Total (6 months)	33	17	14	2	15	3	10	2	10	10
Dundee:										
January	3	—	3	—	3	—	3	—	—	—
February	4	—	4	—	2	—	2	—	—	—
March	3	—	3	—	3	—	3	—	—	—
April	—	—	—	—	—	—	—	—	—	—
May	—	—	—	—	—	—	—	—	—	—
June	1	1	—	—	1	1	—	—	1	1
Total (6 months)	11	1	10	—	9	1	8	—	1	1
Dunrobin:										
January	1	—	1	—	1	—	1	—	2	2
February	3	—	2	1	1	—	0	1	—	—
March	1	—	1	—	1	—	1	—	2	2
April	7	—	3	4	6	—	2	4	—	—
May	8	—	5	3	8	—	5	3	1	1
June	3	1	1	1	3	2	0	1	1	1
Total (6 months)	23	1	13	9	20	2	9	9	6	6
Rothesay:										
January	2	—	1	1	2	—	1	1	1	1
February	—	—	—	—	—	—	—	—	—	—
March	1	—	1	—	1	—	1	—	—	—
April	1	—	1	—	1	—	1	—	—	—
May	2	1	—	1	2	1	—	1	—	—
June	3	3	—	—	0	0	—	—	—	—
Total (6 months)	9	4	3	2	6	1	3	2	1	1
Pinmore:										
May	5	—	4	1	5	—	4	1	2	2
June	5	3	1	1	5	3	1	1	3	3
Total (2 months)	10	3	5	2	10	3	5	2	5	5

In three cases where the alterations have been left doubtful by Mr. Buchan, the table shows those that have eventually been adopted.

As to the question of the sea level reduction, we print returns from two English stations, Dartmoor (1,359 feet) and Buxton (987 feet), which are reduced by the same tables as have been used for Braemar.

I can only say, that we do not find persistent discrepancies between the readings from these stations and those actually at sea level, as have been noted in the Braemar sheet for June, and further, that if allowance be made for the difference between the temperature at sea level and at the station, the apparent error will (in the case of Braemar) in most instances be increased.

At Braemar there is no attached thermometer. The barometrical observations would not, therefore, *usually* be accepted for publication anywhere.

At Dunrobin, Pinmore, and Rothesay no observations of cloud or wind force are given, and at Braemar and Dundee the force and direction of motion of cloud is not recorded. No initials of weather are inserted at either station.

The omission of this information as to clouds or wind force would also be a bar to the publication of any observations from such station.

The Office never prints altered observations without the consent of the observer in writing. In the case of the Scotch stations, Mr. Buchan is in the place of the observer, by his own request.

The reading at Braemar at 9 p.m. June 23rd is given as 29·660 inches in the schedule, not 29·587 as stated by Mr. Buchan.

I may say that this office accepts no returns for publication unless the observer has for several consecutive months filled up, with good observations, each column of the form inserted in the "Instructions in the Use of Meteorological Instruments, 1875."

As to the Royal Meteorological Society, I have been chairman of its Editing Committee for 12 years, during eight of which it has published observations from its stations, and I can only assure the Council that the Society is stricter in its demands on its observers than the Office.

In conclusion I would say that it appears to me not only desirable, but even necessary, that the inspectors of the Office should learn the quality of work they are to require from the stations they inspect.

June 14th, 1884. (Signed) ROBERT H. SCOTT.

Read—Letter 1204 from Dr. Russell, forwarding two papers, one on London rain, the other on the amount of carbonic acid in London air (Minutes, 1882, p. 15).

Resolved—That these Reports be printed in the "Monthly Weather Reports."

Read—A Letter (No. 1273) from Mr. Shaw, giving an account of the progress of his hygrometrical inquiries (Minutes, 1883, pp. 64, 78).

Resolved—That the sum of 50*l.*, as originally proposed (Minutes, 1879, p. 50), be paid to Mr. Shaw.

The draft "Principles of Weather Forecasting," by the Hon. R. Abercromby was approved for publication (Minutes, 1883, p. 99).

Specimens of cloud pictures from the Autotype Company were submitted and approved (Minutes, p. 8).

Read—(Letter 1187) from Dr. Neumayer relative to the supply to him of information for the South Atlantic Ocean (Minutes, 1883, p. 94). Mr. Scott stated that the cost of the supply of data, as estimated, would be from 18*l.* to 20*l.*

It was resolved that no charge be made to Dr. Neumayer for the supply of this information. The observations to be copied without interference with the work of the Office.

Read—A memorandum from Captain Toynbee reporting that since the last meeting seven logs had been received, three of them being "excellent."

Observer.	Ship.	Period.	Voyage.	Last mention on Minutes.
Capt. S. Trott -	S.S. "Minia" -	Jan. 1—May 3, 1884.	Cable laying in North Atlantic.	—
Capt. A. M. L. Wait	H.M.S. "Spartan"	Jan. 25—June 4, 1884.	Cape and home, two voyages.	1883, p. 99.
Capt. A. Watson -	Barque "Elvira"	Sept. 17, 1883—May 28, 1884.	Pernambuco, New Orleans, and home.	—

Mr. Scott was instructed to present the the Charts (O. 32) to Captains Trott and Watson, and to convey the best thanks of the Council to Captain Wait.

Mr. Scott reported that Professor Mascart was anxious, if possible, to obtain from the United States telegraphic reports of weather on the coast and over the Atlantic, and had requested him to inquire if the Council would be willing to join in such an undertaking.

He (Mr. Scott) stated that he had had communications on the subject with Captain Ray, of the Chief Signal Office, and with Lieutenant Chadwick, United States Naval Attaché, and that these gentlemen had assured him of the readiness of their respective offices, the Chief Signal Office and the Hydrographic Office, Washington, to co-operate with European offices in this matter.

Resolved—That Mr. Scott be instructed to ascertain the nature of information obtainable from the eastern coast of the United States from arriving ships and from

land stations, and the probable cost of its telegraphic transmission to England in a codified form.

General Strachey submitted to the Council an instrument which he had devised for drawing the curves of a harmonic expression.

Resolved—That Mr. Légé's charge for its construction, amounting to 27*l.* 13*s.*, be paid.

Submitted—The following report on the forecasts for May 1884:—

The letters used have the following signification:—

a complete success.
b partial (*i.e.*, more than half) success.
c partial failure.
d total failure.

MAY.

3 30 P.M.

Districts.		Percentages. Wind.	Weather.	Average Forecast.	Percentage of Success a + b.
Scotland, N.	a	44	74	59	83
"	b	26	22	24	
"	c	15	4	10	
"	d	15	0	7	
Scotland, E.	a	48	59	54	89
"	b	37	33	35	
"	c	11	4	7	
"	d	4	4	4	
England, N.E.	a	63	45	54	82
"	b	30	26	28	
"	c	0	22	11	
"	d	7	7	7	
England, E.	a	59	42	51	79
"	b	22	35	28	
"	c	11	12	12	
"	d	8	11	9	
Midland Cos.	a	63	52	58	86
"	b	26	30	28	
"	c	7	11	9	
"	d	4	7	5	
England, S.	a	70	58	64	87
"	b	22	23	23	
"	c	8	8	8	
"	d	0	11	5	
Scotland, W.	a	41	63	52	75
"	b	26	19	23	
"	c	26	11	18	
"	d	7	7	7	
England, N.W.	a	48	48	48	76
"	b	30	26	28	
"	c	18	11	15	
"	d	4	15	9	
England, S.W.	a	59	52	56	74
"	b	19	18	18	
"	c	18	15	17	
"	d	4	15	9	
Ireland, N.	a	52	63	58	84
"	b	30	22	26	
"	c	7	4	5	
"	d	11	11	11	
Ireland, S.	a	54	50	52	81
"	b	23	35	29	
"	c	12	11	12	
"	d	11	4	7	

8.30 P.M.

Districts.		Percentages. Wind.	Weather.	Average Forecast.	Percentage of Success a + b.
Scotland, N.	a	61	58	60	84
"	b	16	32	24	
"	c	7	10	8	
"	d	16	0	8	
Scotland, E.	a	68	55	62	84
"	b	19	26	22	
"	c	3	19	11	
"	d	10	0	5	
England, N.E.	a	71	52	62	80
"	b	13	23	18	
"	c	6	19	12	
"	d	10	6	8	
England, E.	a	52	45	49	79
"	b	32	29	30	
"	c	16	13	15	
"	d	0	13	6	
Midland Cos.	a	65	45	55	79
"	b	19	29	24	
"	c	16	13	15	
"	d	0	13	6	
England, S.	a	61	55	58	84
"	b	29	23	26	
"	c	10	9	10	
"	d	0	13	6	
Scotland, W.	a	48	55	52	78
"	b	23	29	26	
"	c	16	16	16	
"	d	13	0	6	
England, N.W.	a	49	58	54	81
"	b	32	23	27	
"	c	13	6	10	
"	d	6	13	9	
England, S.W.	a	52	55	54	75
"	b	26	16	21	
"	c	16	10	13	
"	d	6	19	12	
Ireland, N.	a	55	65	60	86
"	b	29	23	26	
"	c	6	9	8	
"	d	10	3	6	
Ireland, S.	a	45	55	50	86
"	b	39	32	36	
"	c	6	10	8	
"	d	10	3	6	

SUMMARY.

British Isles	a	55	56	56	82
"	b	26	26	26	
"	c	12	10	11	
"	d	7	8	7	
British Isles	a	57	54	56	81
"	b	25	26	25	
"	c	11	12	12	
"	d	7	8	7	

Submitted—The following statement of work for May 1884 :—

MARINE ROOM.

June 10, 1884.

Examined 23 new logs.

North Atlantic Weather Charts.

The first drawing of the isobars for November 1882, and the preparation of the December tracings well advanced.

The preparation of sea and land observations kept up to date.

The charts for August 28, 29, and 30, 1882, have been reduced to the scale of one fourth in two sets, for *Barometer, Wind and Weather*, and for *Air and Sea Temperatures and Weather*, as specimens of the method in which it is proposed to publish the results. The two charts for the 30th completed and forwarded to lithographer.

Carrying out various alterations in charts previously reported as completed.

Forms received have been acknowledged, and at the same time steps taken to discontinue the collection of further observations.

The female clerks engaged in advancing the charts from December 1882 to April 1883. One member of this Branch has been absent from illness for three weeks.

Five days of one clerk's time occupied in the collection of data from ships arriving in London.

General.

Supplying Dr. Neumayer with an estimate of the cost of copying observations contained in the Office for the South Atlantic in the 13 months ended September 30, 1883 (Letter M.O. 1187).

Extracts made from the logs of 17 ships, showing the weather in the vicinity of Cape Finisterre from June 15 to 30, 1881, for Mr. Philip Bennett (Letter M.O. 1243).

Indexing data in ocean 10-degree squares.

(Signed) CHAS. HARDING.

The Marine Superintendent. C. W. B.

TELEGRAPHIC (FORECAST AND STORM WARNING) BRANCH.

June 11, 1884.

Preparation of Monthly Weather Report :—

1884, *April*.—Copy completed and sent to press.

„ *May*.—In hand ; fairly up to date.

Daily Forecast Checking, 1884.—Fairly up to date.

Storm Warning Checking, 1883.—Nearly completed ; about three days more work for two clerks remains to be done.

Calculation of Values for Accumulated Heat, Bright Sunshine, and Rainfall for each Week and Quarter in the Six Years, 1878–83.—The values for the first quarter are ready, and those for the other three quarters are in hand, but the progress will be slow until Messrs. Brodie and Francis are free to aid in the work ; at present their time is being entirely taken up by the daily routine work and the checking of the 1883 storm warnings.

(Signed) FREDC. GASTER.

PANTAGRAPH ROOM.

June 1, 1884.

Quarterly Weather Report :—Part I., 1877.—The tables, charts, and letterpress have been completed, and the whole forwarded to the printer.

Part II., 1877.—The gale tables and wind charts have been prepared, and the daily charts for use in preparing the General Summary are now in hand.

The proofs of all the plates for 1878, which had been kept back for some time, have been checked.

The Bunhill Row sunshine cards for the first quarter of the year have been tabulated for the Royal Meteorological Society.

The barograms showing the Krakatoa disturbance of last August are in course of reduction for the preparation of a complete plate, to show the oscillations at all the stations.

Mr. Call commenced his duties in this room on the 8th ; C. Bracey and L. Powers have been chiefly engaged on work for the Computing Room.

Harmonic Analyser.—The temperature curves for 1879 were commenced at the beginning of the month, and are about half finished.

(Signed) R. H. CURTIS.

R. H. Scott, Esq., F.R.S., &c.

EXAMINATION ROOM.

June 2, 1884.

SIR,

THE following *Curves* and *Tabulations* have been examined during the months of May 1884 :—

September (1882) : *Anemograms*, four stations.

November (1882) : *Thermograms*, four stations ; *Barograms*, four stations.

The *Notes of Errors* and Monthly Report thereon for September 1882 have been written out.

I am, &c.

R. H. Scott, Esq., M.A., F.R.S., (Signed) T. E. ALLEN.
Secretary, Meteorological Council.

Reported—That the following cheques had been drawn during the month of May:—

1884.		£	s.	d.	£	s.	d.
3rd May.	W. Allingham, copying observations for Chief Signal Officer - -	2	4	1			
„ „	„ collecting synchronous observations - -	1	11	6			
					3	15	7
„ „	For weekly salaries - - -	-		-	28	14	11
10th „	Stationery Office, sale of forms - -	-		-	3	12	3
„ „	Royal Meteorological Society, observations -	16	13	4			
„ „	„ „ illustration of paper of Gale of Sept. 1st–3rd, 1883 -	15	0	0			
					31	13	4
„ „	For weekly salaries - - -	-		-	28	14	11
17th „	„ „ - - -	-		-	28	14	11
22nd „	Stationery Office, Annual Reports - -	-		-	33	4	6
„ „	T. De La Rue & Co., sun cards - -	-		-	24	8	8
24th „	For weekly salaries - - -	-		-	28	14	11
31st „	„ „ - - -	-		-	28	14	11
„ „	R. H. Scott, salary - - -	-		-	66	13	4
„ „	J. S. Harding, junr., salary - -	-		-	27	15	6
„ „	T. D. Bell, salary - - - -	-		-	14	8	10
„ „	J. E. Cullum (Valencia), salary - -	-		-	16	13	4
„ „	R. H. Curtis -	Discussion, &c. of observations -			22	4	5
„ „	J. A. Curtis -				16	13	4
„ „	T. E. Allen -				15	11	1
„ „	C. H. Thompson -				11	13	4
„ „	H. N. Cobley -				10	16	3
„ „	E. G. Aldridge -				9	15	10
„ „	S. Call - -				8	18	1
„ „	F. Gaster -	Preparation, &c. of Weather Reports -			30	17	0
„ „	F. J. Brodie -				19	13	0
„ „	G. G. Francis -				20	1	6
„ „	A. J. Rigby -				16	5	0
„ „	R. Sargeant -				13	0	3
„ „	Capt. H. Toynbee - - -	Discussion, &c. of observations and care of instruments.			33	6	8
„ „	Nav. Lieut. C. W. Baillie, R.N. -				20	16	8
„ „	R. Strachan - - -				27	15	6
„ „	C. Harding - - -				22	4	5
„ „	H. Harries - - -				13	6	8
„ „	W. Allingham - - -				13	6	8
„ „	W. G. James - - -				9	12	0
„ „	Postmaster General, telegrams - - - -				215	6	11
„ „	C. Carpmael, synchronous observations - - -				4	10	0
„ „	R. H. Curtis, re-colouring maps of sea temperature -				3	4	0
„ „	R. Gibbons, erection of instruments at Belmullet - -				1	15	8
„ „	J. S. Harding, junr., petty cash - - - -				50	0	0
„ „	Scottish Meteorological Society, observations - -				19	15	0
					£996	9	7

116, *Victoria Street, June* 25, 1884.

PRESENT:

LIEUT.-GENERAL STRACHEY IN THE CHAIR.

MR. DE LA RUE.	PROFESSOR STOKES.
MR. GALTON.	MR. STONE.

THE HYDROGRAPHER.

The Secretary was in attendance.

The Minutes of the last meeting (June 11) were read and confirmed.

The following resolution, in reply to the letter from the Directors of the Ben Nevis Observatory (Minutes, p. 13) was adopted, and the Secretary was instructed to forward it (P.C. 1502):—

THE Meteorological Council have had under their consideration Mr. Buchan's letter of the 14th May, containing certain representations from the Directors of the Ben Nevis Observatory, relative to the amount of the contribution which the Meteorological Council had offered to make in aid of the Observatory, and the conditions under which it should be continued.

The Council consider that it will be convenient, before stating the conclusions to which they have come on the points discussed in Mr. Buchan's letter, shortly to recapitulate the circumstances which have led to the representations now before them.

In November 1883, when the Ben Nevis Observatory was nearly ready to be brought into operation, the Directors inquired of the Council whether they desired to have the observations made there sent to the Meteorological Office by telegraph. On the 3rd December 1883, the Council replied that they did not then desire regular daily telegrams, but that they would wish to be informed by telegraph whenever any striking change of conditions or a special phenomenon of great interest was recorded, leaving it to the Superintendent of the Observatory to use his own discretion in acting on this general wish. The Council at the same time stated their intention of contributing 100*l.* for the then current year, and the same sum in future years while the Observatory was kept in operation, subject to the continued payment of the Government grant to the Meteorological Office.

It was understood by the Council, both when making their offer in December 1883, and in their earlier communications with the Scottish Meteorological Society relative to the proposed establishment of the Ben Nevis Observatory, that the information supplied to the Meteorological Office should be at the complete disposal of the Council, to be used in such manner as they thought fit, and might at their discretion be published in the daily reports.

On the 29th January 1884, Mr. Buchan wrote to inform the Meteorological Office that an agreement had been made with the Press Association for the supply to it of a daily weather report, and confirming the arrangement under which occasional telegrams should be sent from Ben Nevis to the Office, but making no reference to the circumstance that the agreement with the Press Association was for an exclusive privilege.

The Meteorological Council was consequently not prepared for the receipt only a day afterwards of a notice from the Press Association claiming for itself the exclusive right of publishing reports of the observations made on Ben Nevis, and a communication on the subject was at once addressed to Mr. Buchan (1st February), stating that, in the opinion of the Council, it must be understood that the Meteorological Office would be at liberty to receive and publish any telegraphic information that might be forwarded to it from Ben Nevis, and that the notice of the Press Association appeared to require correction.

To this Mr. Buchan replied on the 18th February, stating that the Directors were of opinion that the agreement with the Press Association would not interfere with the Meteorological Council receiving all the information they desired, in conformity with the terms of the letter of 3rd December 1883, but that in case of necessity they could review the agreement with the Association in November next. No reference having been made in this letter to the exclusive privilege of publication, the Secretary wrote to the Association, stating that the Meteorological Office claimed the right of publishing the reports it received from Ben Nevis, under the arrangement made with the Directors of the Observatory, and in reply was informed that the Association did not recognize any such right, and that under no circumstances could they agree to the reports in question being incorporated in the daily meteorological compilation issued to the press by the Meteorological Office.

The Council therefore decided that the question at issue could only be settled by the Directors of the Observatory, and Mr. Buchan was again addressed on the 23rd February stating again the claim of the Council to publish and embody in their reports the telegraphic information received by the Office from Ben Nevis.

In reply to this, Mr. Buchan wrote, under instructions from the Directors of the Observatory, on the 19th March, recognizing that "it was arranged, in compliance with a wish expressed by the "Meteorological Council, that Mr. Omond should send occasional telegrams to the Meteorological "Office whenever any striking change of conditions or special phenomenon of great interest "occurred. The information sent in these occasional telegrams the Meteorological Office is, of "course, at liberty to publish." He went on to say that although "the Press Association have "the right, for the rest of this year, to exclusive publication of a daily weather report of the limited "character mentioned above" (viz., for 9 a.m. and 4 p.m.), "the Directors do not see why the "Meteorological Office may not even this year be furnished with a daily weather report direct "from the Observatory, not for immediate publication, but for use in the Office."

The substance of this reply was communicated, on the 21st May, to the Press Association with a request that if the Association continued to object to the claim of the Meteorological Office, any further discussion of the subject should take place between the Association and the Scottish Society. The Office has heard nothing more from the Association.

On the 31st March a letter was addressed to Mr. Buchan, by direction of the Council, forwarding a cheque for 100*l.*, being their contribution for the Ben Nevis Observatory for the year ending on that day, and observing that the statement contained in Mr. Buchan's letter of the 19th March (before quoted) as to the Office being at liberty to publish the information received from Ben Nevis was for the present satisfactory, but it was distinctly stated that "the continuance of their con-"tribution in future must depend on their receiving for publication, in any manner they think "most suitable, such information from the Observatory as they may from time to time require for "the preparation of the daily forecasts or weather reports."

Before any reply was received to this letter, the Secretary to the Council received, 14th April, a letter from Mr. Omond, the Superintendent of the Ben Nevis Observatory, containing the following passage:—"I have been instructed by the Directors in future to send these telegrams "the day after the changes recorded in them occur. That is, you will receive in the course of the "forenoon an account of the previous day's observations." An inquiry was immediately made of Mr. Buchan whether this was correct, the remark being added that, if so, it would entirely destroy the value of the telegraphic reports from Ben Nevis.

No reply having been given to this, the Secretary again wrote, at the desire of the Council, on 2nd May, to request an early answer.

The answer of the Directors was despatched on the 14th May, and it forms the subject of the present Minute of the Council. The facts, as above recited, are not controverted, but the Directors appear to hold that there was no understanding with the Council that the reports sent to the Meteorological Office should be available for publication "though inferences to which they may "have contributed in forecasting may at once be published."

The Council are unable to assent to this view, and they cannot reconcile it, or the orders given to Mr. Omond, with the statement of an opposite character contained in Mr. Buchan's letter of the 19th March, already quoted. It is clear that the chief value of the telegraphic reports for the purpose of weather forecasts would be destroyed if they were not sent till the day following that on which the observations are made; and it being an essential part of the system adopted by the Meteorological Office to state the facts on which the forecasts are based, it is necessary that the substance of the reports from Ben Nevis, if made use of, should be mentioned.

The Council disclaim any desire to discuss the propriety of the action of the Directors of the Observatory in the arrangements they have made with the Press Association. The only matter that concerns the Council is how that action should affect the continuance of the grant of 100*l.* yearly which had been promised, as before explained.

The Council is clearly of opinion, as was stated in their Secretary's letter of the 31st March, that the only terms on which the grant can be continued is that the information shall be supplied, and shall be absolutely at the disposal of the Office for the purpose of being used in connexion with the preparation of the regular daily forecasts in such manner as may be thought most suitable by the Council. The Council cannot assent to any limitation of their discretion in this matter. The instructions given to Mr. Omond, referred to above, which render telegraph reports from Ben Nevis comparatively useless for the purposes of the Meteorological Office, will, if maintained, preclude the Council from continuing the grant. Moreover, the funds which they administer being placed at their disposal for the use of the public, they could not consent to apply them in aid of the maintenance of an institution which has assigned the exclusive right of the publication of its observations to the Press Association.

As to any future increase of the contribution to the Observatory, the Council must remark that until they are able to assure themselves, which up to the present time they have been unable to do, of the special value of the Ben Nevis observations in influencing conclusions as to coming weather derived from other sources o information already open to them, they consider the proposal of the Directors premature; and in any case the many other demands on the funds at their command, which are already fully disposed of, will make it difficult for the Council to comply with the wishes of the Directors.

With reference to the expressions in a letter from Mr. Scott, which are noticed by the Ben Nevis Directors as indicating a desire to interfere with the officers of the Observatory, the Council observe that Mr. Scott's letter appears to have been an informal one to Mr. Omond, in reply to an inquiry from him, and the Council are assured that it had no such intention as is imputed to it. Apart from the expression of Mr. Scott's personal opinion as to the agreement with the Press Association, which no doubt might better have been omitted, the communication in question was only designed

to give information as to the nature of the reports desired for the use of the Meteorological Office, under the terms of the arrangement which it was understood had been come to. The Council cannot see how the reasonable requirements of the Meteorological Office could be properly met unless direct communications were authorised between the executive officers of the Council and the Ben Nevis Observatory, on the understanding, of course, that they involved nothing more than inquiries or explanations as to the observations sent or to be sent from the Observatory.

It was resolved to forward to Mr. Buchan an extract from Mr. Scott's statement, in reply to his letter (Minutes, p. 22). (P.C. 1486).

Mr. Scott reported that the coefficients for air temperature had been computed from the results furnished by the harmonic analyser for all the observatories for the years 1871–78 inclusive, for monthly periods, and that the coefficients for the years 1879–80 would be completed in the course of the autumn.

He was instructed to ascertain and report as to the length of time required to obtain coefficients for five-day periods.

Mr. Scott reported that on the 23rd instant he had had an interview with the Secretary to the Anglo-American Telegraph Company relative to the probable cost of messages from New York (Minutes, p. 25), and that he had ascertained that possibly messages, if not codified and if transmitted as "deferred messages," might be forwarded over the Company's lines at the reduced press rate of 6*d.* per word.

He was instructed to make the inquiry, and report (P.C. 1451).

The specimen copy of "Charts of the Surface Temperature of the Atlantic, Pacific, and Indian Oceans" Official No. 59), was submitted and approved.

Read—A memorandum from Captain Toynbee reporting that since the last meeting six logs had been received, five of them being "excellent."

Observer.	Ship.	Period.	Voyage.	Last mention on Minutes.
Capt. T. W. Freeman	S.S. "Bellerophon."	Feb. 9—June 9, 1884.	China and home, viâ Suez	1883, p. 108.
Capt. W. H. Smith, R.N.R.	S.S. "Circassian"	Aug. 31, 1883—Mar. 21, 1884.	North America and home, five voyages.	1883, p. 55.
Capt. W. Spratly -	S.S. "Mozart" -	Dec. 6, 1883—June 10, 1884.	Brazil and home, two voyages.	1882, p. 42.
Comr. Hon C. P. Vereker. Lieut. A. J. Balfour	H.M.S. "Magpie"	Jan. 1—April 30, 1884.	Surveying in China Seas	1883, p. 108.
Capt. F. Mallandaine	"Imberhorne" -	Feb. 25, 1883—April 7, 1884.	Sydney, San Francisco, and home.	—

Mr. Scott was instructed to present the Charts (O. 27) to Captain Mallandaine, and to convey the best thanks of the Council to the other observers.

Mr. Scott reported that the station at Dungeness was ready to commence reporting, and he was instructed to discontinue the reports from Dover on the 1st proximo, and to withdraw the instruments. He was also instructed to discontinue the telegraphic reports from Hawes Junction (Minutes, 1882, p. 109), and to reduce the allowance to the observer, in accordance with the usual practice, from the same date.

Read—A letter (No. 1457) from the Royal Meteorological Society, inquiring if the Council would allow 25*l.* as usual towards the cost of their inspections in 1884.—Authorized (Minutes, 1883, p. 45).

SUBMITTED—The following STATEMENT respecting the RECORDS for November 1882, received from the SELF-RECORDING OBSERVATORIES (see Minutes, 21st December 1868 and 20th November 1876).

—	Aberdeen.		Armagh.		Falmouth.		Glasgow.		Kew.		Stonyhurst.		Valencia.	
ANEMOGRAPH:—	Direction. Good.	Velocity. Good.	Direction. Good.	Velocity. Good.	Direction. Good.	Velocity. Good.	Direction. Good.	Velocity. Good.	Direction. Good.	Velocity. Good.	Direction. Good.	Velocity. Good.	Direction. Good.	Velocity. Good.
Action														
Records deficient, due to stoppage of clock	0	0	0	0	0	0	0	0	0	0	0	0	0	0
„ „ other causes	0	0	0	0	0	0	0	0	0	0	†1 ‡8	†1 ‡11	0	0
Orientation verified	25th	—	30th	—	17th	—	—	—	28th	—	23rd & 29th	—	6th	—
No. of errors discovered by subsidiaries	0	0	0	0	0	0	0	0	0	0	0	0	0	0
„ „ irregular differences	0	0	0	1	0	1	*61	0	3	0	0	4	2	10
Result of 40 *Remeasurements*:—														
Greatest difference	0·0	1·0	0·0	1·0	0·0	1·0	1·0	1·0	0·0	1·0	1·0	1·0	1·0	3·0
Mean difference irrespective of sign	0·0	0·4	0·0	0·3	0·0	0·3	0·1	0·3	0·0	0·6	0·0	0·4	0·0	0·7
Residual difference (—Meteorological Office)	0·0	0·0	0·0	—0·1	0·0	—0·2	0·0	0·0	0·0	0·0	0·0	—0·2	0·0	—0·3
RAIN GAUGE:—														
Action	Good.		Good.		Good.		Indifferent.		Good.		Good.		Good.	
Records deficient, due to stoppage of clock	0		0		0		0		0		0		0	
„ „ other causes	0		0		0		0		0		0		0	
Errors in tabulation	1		0		0		18		3		12		0	

BAROGRAPH —							
Action	Good.	Good.	Good.	Good.	Good.	Good.	Good.
Photography	Do.	Do.	Do.	Indifferent.	Do.	Do.	Do.
Records deficient, due to stoppage of clock	0	0	0	0	0	2 hrs.	0
,, ,, failure of light	0	0	0	0	0	0	0
,, ,, other causes	§3	0	‖1 hr.	0	0	§1 ¶1	0
No. of errors discovered—							
In entry of standard	0	3	1	4	7	5	1
,, calculating residual correction	0	0	0	0	2	0	0
,, applying residual correction	2	1	0	1	0	2	1
,, subtraction in subsidiary tables	0	0	0	1	3	2	2
,, tabulation by subsidiaries	0	0	0	0	0	0	0
,, ,, irregular differences	0	1	0	2	1	5	2
Result of 40 *Remeasurements :—*							
Greatest difference	·005	·008	·005	·005	·006	·005	·008
Mean difference irrespective of sign	·002	·003	·002	·002	·002	·002	·002
Residual difference (—Meteorological Office)	·000	·001	·000	·000	·000	·000	·000
Mean monthly difference between simultaneous Barograph and Barometer readings	·002	·002	·001	·002	·002	·001	·002

THERMOGRAPH :—																
Action	Good.		Good.		Good.		Good.		Good.		Good.		Good.			
Photography	Do.		Do.		Do.		Indifferent.		Do.		Do.		Do.			
	Dry.	Wet.	Dry.	Wet.	Dry.	Wet.	Dry.	Wet.	Dry.	Wet.	Dry.	Wet.	Dry.	Wet.		
Records deficient, due to stoppage of clock	0	0	0	0	0	0	0	0	0	0	0	0	0	0		
,, ,, failure of light	0	0	0	0	0	0	0	0	0	0	0	0	0	0		
,, ,, imperfectly moistened bulbs	—	0	—	0	—	31 hrs.	—	0	—	5 hrs.	—	0	—	0		
,, ,, partially frozen bulbs	—	6 hrs.	—	12 hrs.	—	0	—	5 hrs.	—	3 hrs.	—	3 hrs.	—	0		
,, ,, other causes	§1	§1	0	0	0	0	0	0	0	0	**1	0	0	0		
No. of errors discovered in entry of Standard	0	0	3	1	0	2	0	1	0	0	3	5	1	1		
,, ,, by subsidiary measurements	0	0	0	0	0	0	0	0	0	0	0	0	0	0		
,, ,, of subtraction in do. tables	0	0	1	0	0	0	1	1	3	4	1	0	1	1		
,, ,, detected under glass scale	0	0	0	0	0	0	0	1	0	1	1	1	0	0		
Result of 40 *Remeasurements :—*																
Greatest difference	0·2	0·2	0·2	0·2	0·3	0·4	0·3	0·3	0·2	0·2	0·3	0·3	0·3	0·3		
Mean difference irrespective of sign	0·1	0·1	0·1	0·1	0·1	0·1	0·1	0·1	0·1	0·1	0·1	0·1	0·1	0·1		
Residual difference (—Meteorological Office)	—0·1	0·0	0·0	0·0	0·0	—0·1	0·0	—0·1	0·0	0·0	—0·1	—0·1	+0·1	0·0		
Mean monthly difference between simultaneous Thermograph and Thermometer readings	0·10	0·19	0·13	0·13	0·10	0·10	0·22	0·14	0·11	0·15	0·12	0·12	0·15	0·17		
No. of errors in maxima and minima	1	—	5	—	2	—	4	—	3	—	7	—	3	—		

* 48 of these were omissions from tabulation † Testing orientation. ‡ Not sufficiently damped. § Changing too near the hour.
‖ Photographic imperfections. ¶ Cleaning clock. ** Out of focus.

116, *Victoria Street, July* 8, 1884.

PRESENT:

LIEUT.-GENERAL STRACHEY IN THE CHAIR.

MR. DE LA RUE. | PROFESSOR STOKES.
MR. GALTON. | MR. STONE.
THE HYDROGRAPHER.

The Secretary was in attendance.

The Minutes of the last meeting (June 25) were read and confirmed.

Mr. Scott reported that on the 30th ultimo he had had an interview with the Postmaster-General with reference to a reply of his to a question in the House of Commons on the 23rd ultimo, and that, at Mr. Fawcett's request, he had written the following letter, which he submitted, with the reply of the Post Office:—

SIR, June 30, 1884.

I AM instructed to ask if the Post Office is prepared to allow country postmasters to exhibit our forecasts in their windows, if the cost of transmission of these forecasts is defrayed by the recipient or by this Office.

At the present season we issue gratuitous forecasts to some 20 gentlemen in various parts of the country in order to test our success. This experiment only goes on in summer. Several of the gentlemen have expressed a wish to have their telegrams exhibited at their post offices, but say that the postmasters require authority to comply with their wishes.

Are we to understand that the Post Office will waive any charge for copying for messages so exhibited?

Yours, &c.
(Signed) ROBERT H. SCOTT.

Right Hon. H. Fawcett, F.R.S.

(M.O. 1556.)

DEAR MR. SCOTT, Post Office, July 5, 1884.

WITH regard to the exhibition of these messages at post offices, I have given instructions for issuing a notice to postmasters, desiring them, where practicable, to put up such notices; but I gather from your letter that you ask something a little different from what you explained to me. Apparently you wish that the copy of a message addressed to a particular individual in the village should be exhibited in the post office without charge. This, I am sorry to say, we cannot do. If a copy of a message is to be made, it must be paid for at the usual rate of 3*d*. If, however, it is desired to exhibit a message addressed to any individual, we can, under a written permission from him, exhibit the message at the office, provided it is not delivered to him.

Yours, &c.
(Signed) HENRY FAWCETT.

Mr. Scott was instructed to issue a notice in the Daily and Weekly Weather Reports stating the terms on which forecasts could be exhibited at post offices.

Submitted—The following letter (Minutes, p. 32):—

(M.O. 1524.)

Anglo-American Telegraph Company, Limited,
26, Old Broad Street, London, E.C.,
July 2, 1884.

SIR,

REFERRING to your letter of 26th instant concerning weather reports from New York, I beg to inform you this Company agrees to your application to charge the messages in question at the press rates for deferred messages. I enclose a copy of our circular, by which you will see that they will only be forwarded between the hours of 6 a.m. and noon, Greenwich time.

If you will have the goodness to let me know the name of your correspondent in New York, and also how the messages will be addressed and to whom they are to be delivered, I will issue the necessary instructions. If we have to hand them to the post office for delivery we shall have to charge the post office rates, in addition to the 6*d*. per word.

Subject to your approval, we will accept them without prepayment in New York, and render an account once a month.

I am, &c.
(Signed) T. H. WELLS,
Secretary.

Robert H. Scott, Esq., M.A., F.R.S.,
Meteorological Office, 116, Victoria Street, S.W.

Special Rates for Press Message.

DEAR SIR, May 13, 1882.

ON and after 22nd instant a special rate of 1s. per word will be charged for press messages containing political and general news for publication, expressed in plain and unabbreviated language, between the United Kingdom and New York and Canada. except for press messages to be forwarded between the hours of 6 a.m. and 12 noon, Greenwich time, the rate for which will be 6*d.* per word.

Arrangements for the application of these reduced rates must be made previously, either at the Accountant's Office, No. 26, Old Broad Street, London, or with the agents of the Company in the provinces.

I am, &c.
(Signed) T. H. WELLS,
Secretary.

Mr. Scott stated that he had not yet received a reply from Lieutenant Chadwick (Minutes, p. 25), as to the supply of the information from New York.

The Chairman was requested, in case the service should not have been previously organised, to endeavour, when at Washington, to make arrangements for sending these messages from New York.

Read—Letter No. 1493 from the Stationery Office, stating that the sum of 145*l.* 5*s.* 10*d.* was chargeable to the Council on account of the charts of sea surface temperature.

Read—Letter 1504 from Mr. W. Baily requesting the loan of the driving apparatus of an anemograph at Kew for the period of six months, for the purpose of testing his integrating anemometer at that observatory, and also for a grant of 10*l.* to defray the cost of the experiment.

Mr. Scott was authorised to accede to the request, subject to a report from Kew as to the operation of the instrument.

Submitted—The following letter:—

(M.O. 1541.) Kew Observatory, Richmond, Surrey,
July 4, 1884.

DEAR MR. SCOTT,

AT the last meeting of the Kew Committee I submitted the following report on Captain Abney's cloud cameras:—

"Having now overcome the difficulties we originally experienced in the manipulation of the cloud cameras, the pairs of negatives now exhibited to the Committee have been obtained. It will, however, be seen that owing to the small quantity of connecting wire (120 yards) placed at our disposal, we are unable to erect the cameras a sufficient distance apart necessary to obtain a measurable amount of parallax in the cloudscapes.

"With a view of lengthening our base line I would, therefore, ask for funds to purchase a sufficient quantity of insulated telegraph wire to lay down a triple line for camera, telephone, and return wire, at least half a mile long.

"This would cost 15*l.* to 20*l.* Additional expense would be entailed in putting the wires underground, and also in erecting a stone pier at the distant station, for which a small rent would have to be paid to Mr. Fuller."

In accordance with the above, I was instructed, therefore, to submit it to the Meteorological Council at their next meeting, and to ask if they would grant the sum of 40*l.* to the Kew Committee in order that farther nephographic experiments might be carried out at this observatory.

I am, &c.
(Signed) G. M. WHIPPLE,
Superintendent.

R. H. Scott, Esq., M.A., F.R.S.,
Secretary of the Meteorological Council.

Resolved—That the sum of 40*l.* be granted.

Read—The following letter (Minutes, 1883, p. 76):—

NEW FALMOUTH OBSERVATORY.

(M.O. 1465.) Royal Cornwall Polytechnic Society,
Falmouth, June 25, 1883.

DEAR SIR,

AFTER considerable trouble the plans of the new observatory have been settled by the committee, but before coming to any arrangement with a builder they are anxious that they should be submitted to you for your approval on behalf of the Meteorological Council.

Special attention has been paid to the exposure of the thermometers and the position of the anemometer, and I trust the arrangements proposed as to these and the instruments generally will be satisfactory.

Our architect, Mr J. A. Tregelles, of 33, Finsbury Circus, has been asked to wait on your with the plans, and I shall esteem it a favour if you will inform him or write me direct as to the anemometer staging or iron column, and the thermometer screen, &c., which the Council will provide, that I may

know if you would like any arrangements made with the builder for the Council on these or any other heads before the specification is finally settled.

Yours, &c.

R. H. Scott, Esq., F.R.S., (Signed) WILSON L. FOX.
116, Victoria Street, London, S.W.

Mr. Scott stated that on the 2nd instant he had seen Mr. Tregelles, and that the plans for the observatory appeared to be satisfactory. He was instructed to reply to Mr. Fox to that effect (P.C. 1566).

Submitted—The following report:—

SIR, Meteorological Office, June 30, 1884.

I HAVE the honour to report, for the information of the Council, on the work which has been done for the quarter ending 30th June 1884.

The mean pressure chart of the Pacific Ocean for the month of February, referred to in my last report, has been completed, with the exception of drawing some few isobars. The charts for the month of May have been commenced and they are now in the following state:—

Atlantic Ocean, nearly complete.
Indian „ do. do.
Pacific „ about half finished.

During Captain Toynbee's absence on leave from 9th June, I have discharged the duties of Marine Superintendent, and have myself been absent for 14 days, summer vacation.

I am, &c.

(Signed) C. W. BAILLIE,
Nav.-Lieut., R.N.

R. H. Scott, Esq., F.R.S., Secretary.

Read—A memorandum from Captain Toynbee, reporting that since the last meeting six logs had been received, three of them being "excellent."

Observer.	Ship.	Period.	Voyage.	Last mention on Minutes.
Capt. Jas. Lawson -	S.S. "Humber"	April 2—June 20, 1883.	Brazil, River Plate, and home.	1883, p. 4.
Capt. A. J. Miller -	"Cannanore" -	April 22, 1883—April 20, 1884.	Rio Chittagong and New York.	1880, p. 82.
Capt. Hon. F. C. P. Vereker. Lieut. A. Balfour -	H.M.S. "Magpie"	May 1—June 24, 1884.	Seychelles and home -	1884, p. 31.

Mr. Scott was instructed to convey the best thanks of the Council to the above observers.

Mr. Scott submitted a specimen of the coefficients from five-day periods obtained from the harmonic analyser work, for the observatory of Valencia and for the year 1879, and stated that the time required had been two days. (Minutes, p. 31.)

Professor Stokes was requested to examine these results.

Sir F. Evans having intimated that, in consequence of his vacating the office of Hydrographer of the Admiralty, the present is the last occasion on which he will be present as member of the Council, it was Resolved—

That the Council record their sense of the great value of his services in connexion with the Meteorological Office, which have extended over more than 10 years. They also desire to recognize the cordial manner in which he has, on all occasions, given his co-operation to his colleagues, and direct that his name be placed on the list of the persons to whom they present their publications.

It was further resolved that a copy of this resolution be communicated to Sir F. Evans.

Submitted—The following statements of work for June 1884:—

MARINE ROOM.

July 8, 1884.

Examined 11 new logs and two lighthouse registers.

North Atlantic Weather Charts.

The first drawing of November 1882 isobars completed, and their revision advanced. The air and sea isotherms for December in hand.

The preparation of sea and land observations kept up to date.

Four reduced charts for August 28 and 29, 1882 completed, in addition to the two for the 30th, as specimens of the proposed method of publishing the results.

Additions and consequent alterations made to charts which were reported as completed in previous statements of work.

Acknowledging receipt of forms and intimating to the observersthat the special collection of data has now ceased.

One clerk engaged for five days collecting data from ships arriving in London.

Experimenting with the eidograph with the view of working directly in ink from glass pens.

Female clerks engaged on the preparation of charts from December 1882 to May 1883, but there have been interruptions consequent upon summer vacation.

General.

Indexing data in ocean 10-degree squares.

Correcting proofs of lithographed variation chart for 1880.

Copying into log 5843 the observations contained in the rough book lent by the observer.

The Marine Superintendent. (Signed) CHAS. HARDING.
C. W. B.

TELEGRAPHIC (FORECAST AND STORM WARNING) BRANCH.

June 1884.

Monthly Weather Reports.—1884, *February.*—Proof revised and handed in. *March.*—Proof being revised; half done. *May.*—The MS. completed; in the rough. *June.*—Fairly up to date.

Checking of Daily Forecasts, 1884.—Complete up to date.

Checking Storm Warnings, 1883.—Completed, summarised, and results handed in.

Accumulated Heat, Rainfall, and Bright Sunshine, for each week in the six years 1878–83. The necessary weekly values are now all copied out, and the calculation of the accumulated values will be completed as soon as the Monthly Weather Report for June 1884 is handed in.

Return for the House of Lords showing what storms have "visited the British Islands between "1st January 1874 and 31st December 1883, of which no warning was issued by the Meteorological "Office, with a notice of the quarter from which each unwarned storm reached our coasts." Each storm not warned for is being examined carefully (this portion of the work being about three fourths done).

Quarterly Weather Report, 1877, Part 2.—Preparation of Table C. for Mr. Curtis. Table for *April*, completed. *May*, in hand.

Table for obtaining the true Mean Temperature of the Air from the Means of the Daily Maxima and Minima.—Prepared.

Hay Harvest Forecasts, 1884.—System organised and issue now in progress.

Belmullet and Dungeness.—Telegraphic Reporting Stations. These new stations are being organised, the work taking much of my own time daily.

Holyhead.—Two men have been partially instructed in reporting.

International Health Exhibition.—Three days of my time were expended in completing the diagrams exhibited there.

Vacation.

Some interruptions have occurred consequent on vacations.

(Signed) FREDC. GASTER.

R. H. Scott, Esq., F.R.S.

PANTAGRAPH ROOM.

July 1, 1884.

Quarterly Weather Report, Part IV., 1876.—The proofs of the letterpress and plates have been revised and returned to printer.

Part II., 1877.—The chart plates have been drawn and the text commenced.

Barometrical Disturbance of August 1883.—All the barograms which have been received have been re-pantagraphed on zinc, preparatory to their being grouped on a complete plate. A list has also been prepared of the tidal curves received, &c.

Harmonic Analyser.—The thermograms for 1879 have been analysed as far as Stonyhurst, the first two months of which station are finished. The five-day coefficients for one station have also been worked out.

Miscellaneous.—Two pantagraphs not at present required have been removed from the room and packed up, and the other instruments carefully packed to prevent rusting, &c. One or two special diagrams have been prepared, and, in addition to the ordinary routine work of the room, Mr. Call, C. Bracey, and L. Powers, have been mainly occupied on work for the Computing Room.

R. H. Scott, Esq., F.R.S., &c. (Signed) R. H. CURTIS.

EXAMINATION ROOM.

SIR, July 1, 1884.

THE following *Curves* and *Tabulations* have been examined during the month of June 1884:—November 1882: *Anemograms*, five stations; December 1882: *Thermograms*, three stations; *Barograms*, two stations.

The *Notes of Errors* and monthly report thereon for November 1882 have been written out and the Valencia work for April and May, required for the Quarterly Report of the Registrar-General of Ireland, has been examined.

I am, &c.

R. H. Scott, Esq., M.A., F.R.S., (Signed) T. E. ALLEN.
Secretary, Meteorological Council.

Submitted—The following statement of accounts for the quarter ending 30th June 1884:—

Income.	£ s. d.	£ s. d.
Balance from year 1883–84		820 10 11
Proportion of Vote for Quarter		3,825 0 0
Repayment of expenses charged under—		
(1.) Incidental expenses	3 2 1	
(2.) Special researches	3 17 11	
		7 0 0
Supply of Weather Information:		
D.W. Charts and Forecasts	59 5 4	
6 p.m. Charts	6 5 0	
Information for Press Agencies, &c.	21 13 6	
Telegrams	66 7 6	
Miscellaneous data	4 2 3	
		157 13 7
Sale of Instruments, &c.:		
Mercantile Marine account		9 13 1
Commission charged on work done for Colonies, &c.		8 12 9
		£4,828 10 4

Expenditure.	£ s. d.	£ s. d.
Administration:		
Payment of Council	250 0 0	
Secretary	200 0 0	
Salaries and wages	187 2 0	
Rent, fuel, and lighting	182 4 7	
Incidental and contingent expenses	125 1 2	
Pensions	10 14 1	
		955 1 10
Special Researches		312 9 7
Land Meteorology:		
Observatories and stations	458 10 4	
Discussion and reduction of observations	332 7 1	
		790 17 5
Weather Information and Forecasts:		
Telegraphic reports and storm warnings	631 17 10	
Preparation and issue of reports and forecasts	375 13 10	
		1,007 11 8
Inspections:		
Salaries and travelling expenses*		3 10 6
Ocean Meteorology:		
Discussion and reduction of observations	442 15 9	
Expenses incidental to the supply of instruments:		
Proportion for care and issue of instruments	50 0 0	
Royal Navy	15 17 0	
Mercantile Marine	88 17 11	
Distant island and coast stations	5 7 4	
		602 18 0
Balance		1,156 1 4
		£4,828 10 4

Liabilities.	£ s. d.
To sundry creditors	1,132 9 11
„ balance	1,156 1 4
	£2,288 11 3

Assets.	£ s. d.
By cash at Bank	1,511 4 3
„ „ at Office	61 15 2
„ „ at Valencia	50 0 0
„ H.M. Exchequer	325 0 0
„ sundry debtors	340 11 10
	£2,288 11 3

* The proportion of salaries of inspectors has, in this instance, not been charged, pending arrangements being made.

Submitted—The following report on the forecasts for June 1884:

The letters used have the following signification:—

a complete success.
b partial (*i.e.*, more than half) success.
c partial failure.
d total failure.

JUNE.

3.30 P.M.

Districts.		Percentages. Wind.	Weather.	Average Forecast.	Percentage of Success a + b.
Scotland, N.	a	60	44	52	82
"	b	20	40	30	
"	c	12	12	12	
"	d	8	4	6	
Scotland, E.	a	44	48	46	80
"	b	28	40	34	
"	c	20	0	10	
"	d	8	12	10	
England, N.E.	a	64	44	54	76
"	b	20	24	22	
"	c	12	12	12	
"	d	4	20	12	
England, E.	a	60	52	56	80
"	b	24	24	24	
"	c	12	8	10	
"	d	4	16	10	
Midland Cos.	a	72	52	62	80
"	b	16	20	18	
"	c	8	4	6	
"	d	4	24	14	
England, S.	a	72	60	66	84
"	b	20	16	18	
"	c	4	12	8	
"	d	4	12	8	
Scotland, W.	a	56	64	60	80
"	b	24	16	20	
"	c	12	8	10	
"	d	8	12	10	
England, N.W.	a	56	72	64	88
"	b	32	16	24	
"	c	8	0	4	
"	d	4	12	8	
England, S.W.	a	44	64	54	82
"	b	36	20	28	
"	c	12	12	12	
"	d	8	4	6	
Ireland, N.	a	48	44	46	78
"	b	36	28	32	
"	c	4	12	8	
"	d	12	16	14	
Ireland, S.	a	36	56	46	72
"	b	32	20	26	
"	c	16	8	12	
"	d	16	16	16	

8.30 P.M.

Districts.		Percentages. Wind.	Weather.	Average Forecasts.	Percentage of Success a + b.
Scotland, N.	a	53	50	52	90
"	b	37	40	38	
"	c	3	7	5	
"	d	7	3	5	
Scotland, E.	a	63	44	54	77
"	b	17	30	23	
"	c	13	13	13	
"	d	7	13	10	
England, N.E.	a	70	60	65	89
"	b	27	20	24	
"	c	3	7	5	
"	d	0	13	6	
England, E.	a	70	60	65	90
"	b	23	27	25	
"	c	7	3	5	
"	d	0	10	5	
Midland Cos.	a	83	50	67	87
"	b	10	30	20	
"	c	7	0	3	
"	d	0	20	10	
England, S.	a	77	50	64	89
"	b	20	30	25	
"	c	0	7	3	
"	d	3	13	8	
Scotland, W.	a	53	63	58	77
"	b	27	10	19	
"	c	17	10	13	
"	d	3	17	10	
England, N.W.	a	60	57	59	80
"	b	23	20	21	
"	c	17	3	10	
"	d	0	20	10	
England, S.W.	a	70	60	65	82
"	b	20	13	17	
"	c	7	20	13	
"	d	3	7	5	
Ireland, N.	a	47	53	50	78
"	b	33	23	28	
"	c	10	7	9	
"	d	10	17	13	
Ireland, S.	a	47	67	57	79
"	b	30	13	22	
"	c	10	3	6	
"	d	13	17	15	

SUMMARY.

British Isles	a	56	55	56	81
"	b	26	24	25	
"	c	11	8	9	
"	d	7	13	10	
British Isles	a	63	56	60	83
"	b	24	23	23	
"	c	9	7	8	
"	d	4	14	9	

Mr. Scott stated that he had written to Mr. Ley to inquire if his health would permit him to undertake his tour of inspection in the present year, and he submitted the following letter:—

(M.O. 1519) Ashby Parva, Lutterworth,
July 1, 1884.

SIR,

IT being still somewhat uncertain whether I shall be able to perform the entire duties of my office this year, it may become desirable to appoint someone else to discharge a portion of them.

Should it happen to be the wish of the Council that I should do so,—though I think it most probable that they would prefer to appoint for this purpose some gentleman connected with the Meteorological Office,—I can name a Fellow of the Meteorological Society, who is intimately acquainted with instrumental work, and who, at the desire of the Council, would, as I think probable, undertake any part of the inspections which I may find beyond my power, and perform it with ability.

In this case I should be glad to have an early reply, since, although I know that he has had leisure some weeks since, I do not know what his arrangements may be for the summer. I will then at once communicate his name or will write to him, whichever the Council desire should be first done.

In this case, if the Council think fit, I would, if he will undertake the work, ask him to pay me a few days visit that I may inform him as to local peculiarities of the stations, the special defects to be looked for, &c., and give him, where needful, letters of introduction. The same, of course, I will gladly undertake, if wished, with anyone else whom the Council may appoint.

I am, &c.
(Signed) W. CLEMENT LEY.

Mr. Scott was instructed to accede to Mr. Ley's proposal, and request him to name the gentleman whom he proposed as "locum tenens" (P.C. 1570).

Reported—That the following cheques had been drawn during the month of June:—

1884.		£ s. d.	£ s. d.
7th June.	For weekly salaries - - -	- -	28 14 11
14th „	„ „ - - -	- -	28 14 11
21st „	A. Légé & Co., integrating instrument -	- -	27 13 0
„ „	W. Martin, fixing instruments at Dungeness	- -	2 14 9
„ „	T. De La Rue & Co., sunshine cards -	- -	2 12 5
„ „	For weekly salaries - - -	- -	28 14 11
28th „	„ „ - - -	- -	28 14 11
30th „	R. H. Scott, salary - - -	- -	66 13 4
„ „	J. S. Harding, jun., salary - -	27 15 6	
„ „	T. D. Bell „ - -	14 8 10	
			42 4 4
„ „	C. W. Jacques, rent - - -	- -	158 15 0
„ „	Pall Mall Coal Co., coals - -	7 0 0	
„ „	„ „ - - -	8 0 0	
			15 0 0
„ „	J. S. Harding, sen., pension - -	- -	10 14 1
„ „	T. Adie, repairing anemometer - -	9 10 0	
„ „	„ „ "A." instruments -	10 8 0	
„ „	„ „ "B.T." „ -	3 11 0	
			23 9 0
„ „	H. N. Shaw, hygrometrical experiments (Minutes, 11th June) - - - -	- -	50 0 0
„ „	W. Thomas, care of Scilly anemometer -	1 13 7	
„ „	„ meteorological reports -	4 18 2	
			6 11 9
„ „	H. Williams, care of bridled anemometer	2 12 2	
„ „	„ „ Robinson's „	2 14 5	
„ „	„ meteorological reports -	2 13 0	
			7 19 7
„ „	C. Niven, Aberdeen Observatory - -	69 5 0	
„ „	J. L. E. Dreyer, Armagh „ - -	12 10 0	
„ „	W. L. Fox, Falmouth „ - -	61 19 6	
			143 14 6
	Carried forward -	- -	£673 1 5

Office

1884.			£	s.	d.	£	s.	d.
		Brought forward -	-		-	673	1	5
30th June.	Kew Committee, allowance - -		100	0	0			
"	"	" postages and sundry expenses - -	8	12	1			
"	"	" verification "A." instruments - -	6	10	0			
"	"	" verification "C." instruments - -	35	13	0			
						150	15	1
"	"	C. Clouston, Orkney - - -	2	10	0			
"	"	G. H. Aird, Seaham - - -	2	13	9			
"	"	S. J. Perry, Stonyhurst - - -	14	0	0			
						19	3	9
"	"	J. E. Cullum, Valencia - - -	53	12	6			
"	"	" salary - - -	16	13	4			
						70	5	10
"	"	J. O'Driscoll, rent at Valencia Observatory	-		-	25	0	6
"	"	G. T. Watson, care of Yarmouth anemometer - -	4	2	6			
"	"	" meteorological reports -	4	4	6			
						8	7	0
"	"	R. H. Curtis -	22	4	5			
"	"	J. A. Curtis -	16	13	4			
"	"	T. E. Allen -	15	11	1			
"	"	C. H. Thompson -	11	13	4			
"	"	H. N. Cobley -	10	16	8			
"	"	S. Call - -	10	16	8			
"	"	E. G. Aldridge -	7	16	8			
		Discussion, &c. of observations - -				95	12	2
"	"	R. Gibbons, Belmullet - - -	1	18	7			
"	"	H. Todd, Cambridge - - -	4	11	0			
"	"	H. Mohn, Christiania - - -	5	10	0			
"	"	J. Costello, Dover - - -	3	18	6			
"	"	J. Lloyd, Dungeness - - -	1	19	10			
"	"	W. Brand, Dunrossness - - -	3	11	6			
"	"	W. Foster, Hawes Junction - -	3	18	3			
"	"	G. G. Appleton, Hurst Castle - -	3	19	6			
"	"	J. Fisher, Jersey - - - -	4	9	0			
"	"	F. Gaster, London - - -	3	18	0			
"	"	W. Berridge, Loughborough - -	3	5	5			
"	"	K. Kerr, Mullaghmore - - -	5	5	2			
"	"	W. D. Penny, Nairn - - -	4	4	6			
"	"	W. Wickham, Oxford - - -	3	12	6			
"	"	G. Phillips, Parsonstown - - -	3	7	6			
"	"	J. John, Prawle Point - - -	3	5	0			
"	"	S. Blake, St. Ann's Head - -	3	7	1			
"	"	J. B. Smith, Spurn Head - -	3	5	4			
"	"	D. Macdonald, Stornoway - -	5	11	1			
"	"	J. Sinclair, Wick - - - -	3	5	0			
"	"	A. Guy, York - - - - -	3	18	0			
						80	0	9
"	"	Postmaster-General, telegrams - -	-		-	136	1	9
"	"	F. Gaster -	31	1	4			
"	"	F. J. Brodie -	20	1	6			
"	"	G. G. Francis -	22	4	0			
"	"	A. J. Rigby -	16	5	0			
"	"	R. Sargeant -	12	0	1			
		Preparation, &c. of Weather Reports - - -				101	11	11
		Carried forward -				£1,360	0	2

			£	s.	d.	£	s.	d.
1884.		Brought forward -	-		-	1,360	0	2
30th June.	Capt. H. Toynbee	Discussion, &c. of observations and care of instruments -	33	6	8			
,, ,,	Nav. Lieut. C. W. Baillie, R.N. -		20	16	8			
,, ,,	R. Strachan -		27	15	6			
,, ,,	C. Harding -		22	4	5			
,, ,,	H. Harries -		13	6	8			
,, ,,	W. Allingham -		13	6	8			
,, ,,	W. G. James -		9	12	0			
						140	8	7
,, ,,	J. Fowler, Cardiff agent - - -		1	19	0			
,, ,,	L. Allen, Dundee ,, - - -		5	1	3			
,, ,,	J. Gill, Liverpool ,, - - -		27	0	0			
,, ,,	C. H. Permain, Southampton agent -		2	4	0			
,, ,,	J. H. Woodstock, packing cases - -		3	1	6			
						39	5	9
,, ,,	Royal Meteorological Society, observations		-		-	27	10	0
						£1,567	4	6

116, *Victoria Street, November* 12, 1884.

PRESENT:

PROFESSOR STOKES IN THE CHAIR.

MR. DE LA RUE.	MR. STONE.
MR. GALTON.	THE HYDROGRAPHER.

The Secretary was in attendance.

The Minutes of the last meeting (July 8) were read and confirmed.

Submitted—The following correspondence (Minutes, p. 29) :—

BEN NEVIS OBSERVATORY.

(M.O. 1657.) Scottish Meteorological Society,
122, George Street, Edinburgh, July 19 1884.

SIR,

IN reply to your letter of the 1st instant, with enclosed extract from the Minutes of the Meteorological Council of June 25th, I am instructed by the Directors to forward you the enclosed extract from their Minutes of July 4th.

I am, &c.
(Signed) ALEXANDER BUCHAN,
Secretary.

R. H. Scott, Esq.,
Secretary, Meteorological Office.

EXTRACT from MINUTES of MEETING of DIRECTORS of the BEN NEVIS OBSERVATORY held 4th July 1884.

The Directors of the Ben Nevis Observatory have had under consideration a letter from the Meteorological Council of July 1st, enclosing an extract from the Minutes of the Council of June 25th in reply to their letter of May 14th.

1. The Directors regret that the Council make no reference to their offer to appoint a deputation to confer with the Council as to the future relations between the two bodies.

2. The Directors beg again to point out that the Council in their letter to the Scottish Meteorological Society of February 17th, 1879, intimated that "they are willing to contribute "100*l.* a year towards the annual expenses of an observatory on Ben Nevis, provided funds can be "obtained for the erection of the building, and that copies of the observations be regularly com-"municated to the Meteorological Office."

The view taken by the Society as to the meaning of this promise may be inferred from the fact that it was used as an inducement to subscribe to the fund for the erection of the buildings.

On learning that the buildings had been erected, the Council intimated to the Directors in their letter of December 3rd, 1883, that they "would allow 100*l.* for the current year, and of course "for the future while the Observatory goes on, only subject to the Government paying our (their) "grant."

No fresh condition relating to the supply of information from the Observatory was attached to this renewed resolution of the Council; and the only such condition attached to it, in the opinion of the Directors, is "that copies of the observations be regularly communicated to the "Meteorological Office."

The Council in their Minute say that "it was understood," by them, "that the information "supplied to the Meteorological Office should be at the complete disposal of the Council, to be "used in such manner as they thought fit, and might, at their discretion, be published in their "Daily Reports." The Directors take no objection to this view of the condition attached to the yearly grant of 100*l.*, but they beg to point out that the information which they undertook to supply consisted only of "copies of observations."

When the Council, in their letter of March 31st, 1884, forwarding a cheque for 100*l.*, being their contribution for the Ben Nevis Observatory for the year ended on that day, stated that "the con-"tinuance of their contribution in the future must depend on their receiving for publication, in any "manner they should think most suitable, such information from the Observatory as they may "from time to time require for the preparation of the Daily Forecasts or Weather Reports," they introduced new conditions, and made a demand of great magnitude,—of such magnitude, indeed, as might practically make the establishment on Ben Nevis a mere observing station for the Meteorological Office.

3. The Directors, however, in their letter of November 16th, 1883, offered, *ex gratia*, to supply to the Meteorological Office more than they had undertaken to supply. They intimated their willingness to give instructions to the Superintendent of the Observatory to forward regularly by telegraph to the Meteorological Office the observations made at any of certain hours named. The Council, in reference to this offer, informed the Directors that they did "not at present wish for regular

telegrams." The newspapers, however, expressed a wish to be furnished with such telegrams, intimating a willingness to pay for them; and there was nothing in their engagement with the Council to prevent the Directors from undertaking to supply the desired information. Accordingly an arrangement till the end of this year was made with the Press Association to supply a daily telegraph report at the rate of 100*l.* per annum.

4. The Council say in their letter of March 31st, 1884, that the statement in the letter from the Directors of March 19th, as to the Office being at liberty to publish the information received from Ben Nevis, was for the present satisfactory. The statement referred to ran thus:—"The Directors "do not see why the Meteorological Office may not even this year be furnished with a daily "weather report direct from the Observatory, *not for immediate publication, but for use in the "Office.*"

The instructions given to Mr. Omond on the 29th March were consequent on a failure on the part of the Meteorological Office to observe the stipulation as to immediate publication contained in the letter just referred to. That failure rendered it necessary for the Directors to adopt a course which secured the fulfilment of their engagement with the Press Association; but the Directors have again intimated to the Council, in their letter of May 14th, that the Meteorological Office can at once be put in possession of the Ben Nevis observations, on the understanding that they "shall "not be *immediately published* in their bare form."

5. The Directors do not hesitate to say that it would be more agreeable to them to furnish such telegrams to the Meteorological Office than to any other quarter. It would be a pleasure to them to find the Ben Nevis Observatory useful in the work of the Office, and they believe that it will yet be found necessary in that work. The Council, however, say that up to the present time "they "are unable to assure themselves of the special value of the Ben Nevis observations in influencing "conclusions as to coming weather derived from other sources of information already open to "them," and that they consequently consider the proposal of the Directors that the grant from the Council should be considerably increased as premature. The Directors hope, however, that this view of their proposal will be altered on reconsideration.

The Council have already shown their approval of the establishment of this high level station as likely to advance the study of meteorology and to be useful in prosecuting the work entrusted to them by the State, and they are aware of the great cost of the buildings and their equipment, and of the large annual expenditure involved in the maintenance of the Observatory. The Council, therefore, practically ask the Directors to make a costly experiment for them. And further, during the years while the experiment is being made, the Council *claim a right* to "receive for publication, "in any manner they think most suitable, such information from the station as they may from "time to time require for the preparation of the Daily Forecasts or Weather Reports." For this the Council consider it sufficient to give a contribution of 100*l.* annually out of the grant of 15,000*l.* which is placed at their disposal by the country for meteorological purposes; and intimate that they must be assured that the Ben Nevis observations have a special value in framing weather forecasts before they can entertain a proposal that the sum be increased.

The Directors beg here to point out that they understand the grant from Government to the Council to be given for the advancement of meteorology broadly. It does not, therefore, appear necessary to the Directors that the Council should be assured of the special value of the Ben Nevis observations in one branch of the work assigned to them, namely, weather forecasting, to prevent their dismissing as premature the request of the Directors.

6. As regards the Council's objection to "aid in the maintenance of an institution which has "assigned the exclusive right of the publication of its observations to the Press Association," the Directors beg to point out that no such general assignment has been made. It is true that *an exclusive right till the end of this year to publish immediately, in a bare form, a daily report of the observations made at 9 a.m. and 9 p.m. on Ben Nevis* has been sold for 100*l.* to the Press Association; but this does not prevent the Council from publishing the copies of observations for which they stipulated; and further, before renewing any engagement with the Press Association, the Directors have undertaken to negotiate with the Council. They have also intimated to the Council, in their letter of May 14th, that if the grant from the Council is suitably increased, they "would endeavour to supply the Meteorological Office with such information as might be asked, "in the quickest way available," and they would consent to the use of that information in any way the Council might think desirable.

7. If the Council, either on the ground that they are not yet assured of the value of the Ben Nevis observations in one special direction, or because they have no money to devote to such an object, are not only unable to increase their grant, but are even unwilling to continue to give the yearly grant which they promised to give, and on the continuance of which the Directors calculated, the Directors deem it right to say that they would regard the resolution as injurious to the country and to science. If such a resolution is reached by the Council, the Directors hope that early intimation of it will be given to them, and they accordingly beg the Council to consider this Minute at an early meeting with a view to come to a definite resolution in regard to the request for an increase of the grant.

BEN NEVIS OBSERVATORY.

Scottish Meteorological Society,
122, George Street, Edinburgh, October 21, 1884.

(M.O. 2317.)

SIR,

I AM instructed by the Directors to forward the annexed extract from their Minutes of the 18th instant.

I am further desired to refer you to the paragraph in my letter of May 14th, wherein the Directors express an opinion that the annual contribution from the Meteorological Council to the Ben Nevis Observatory should be increased to 300*l.*, in which case the Directors would undertake to supply the Meteorological Office with such information from the Observatory as might be applied for, in the quickest way available.

I am, &c.

R. H. Scott, Esq., (Signed) ALEXANDER BUCHAN.
Secretary, Meteorological Council.

EXTRACT from MINUTES of MEETING of DIRECTORS of the BEN NEVIS OBSERVATORY, held 18th October 1884.

"Resolved—That since the Directors must either confirm the present or enter into a new arrangement with the Press Association before the 1st November next, the Secretary be requested, with reference to—

"(1.) The paragraph in his letter of February 18, 1884, stating that 'However should it be found in practice that this arrangement with the Press Association in any way interferes with the scientific usefulness of the observations taken at the Observatory to the Meteorological Council, the Directors will carefully consider the matter in renewing the agreement with the Association in November next;'

"(2.) The paragraph in Mr. Scott's letter of March 31, 1884, stating, that 'The Council observe that the present arrangement with the Press Association does not extend beyond the end of the current year, and they trust that before it is prolonged the Directors will give the Council the opportunity of communicating their views as to the manner in which the interests they represent may be protected, so that all misconceptions shall be avoided, and no disagreeable discussions arise;' and

"(3.) The following extract from the Minutes of meeting of the Directors on July 4th, communicated to the Meteorological Council, viz., 'Before renewing any engagement with the Press Association, the Directors have undertaken to negotiate with the Council;'

to call the attention of the Meteorological Council to this fact, and to remind them that no reply has yet been received to the Directors' Minute, dated July 4th, and forwarded July 19th, 1884.

The consideration of the question was postponed, after discussion.

Reported—That on the 5th of September a meeting had been held at the Office to discuss the subject of the proposed American telegrams (Minutes, p. 35), and that the following Minutes had been taken:—

116, Victoria Street, September 5, 1884.

PRESENT:

Lieut.-General STRACHEY in the Chair.

Mr. GALTON. | THE HYDROGRAPHER.

Captain Toynbee submitted the following memorandum:—

WARNINGS from the WESTERN SIDE of the N. ATLANTIC.

At present we are not in a position to speak decidedly on the value of information telegraphed from America, but it seems quite worthy of a trial.

Such information will certainly be useful to ships outward-bound to America. In fact we have been asked to give notice of ice when seen.

The following example (founded on facts shown in Mr. C. Harding's paper in the Quarterly Journal of the Royal Meteorological Society, Vol. X., No. 49, January 1884), illustrates the use which may possibly be made of such information in forecasting the weather of the British Islands.

SUPPOSED TELEGRAM from NEW YORK on August 31, 1883.

"Noon, August 29th, 1883, in 38° N. 65° W.
"*Wind change* from S.E. to East, force 10 to 11.
"*Barometer*, 29·5.
"*Ice*, several bergs."*

The following paragraph founded on this telegram might appear in the Daily Weather Report:—

August 31st, 1883.

A heavy gale, changing from S.E. to East, in 38° N 65° W. at Noon, 29th.
Several icebergs in the same position.

FORECAST.

Ships outward-bound to North America may expect to meet this gale, though they may have a much lower barometer and their wind may veer from S. to W., instead of from S E. to East, if the centre passes to the northward of them. They will also probably fall in with the ice.

A Southerly gale veering to East in the north and to West in the south may appear off our west coasts to-morrow, September 1st. (This really occurred.)

* The ice was not reported, and has been entered merely to illustrate the value of such information.

GROUNDS for the above FORECAST.

The change of wind on the 29th from S.E. to East proves that the centre of the cyclonic system passed to the southward of the steamer in 38° N. 65° W.; it is therefore supposed that the centre was in about 37° N., where, no doubt, the barometer was much lower than 29·5, as the gradients must have been steep for so heavy a gale.

E.N.E., 30 to 40 miles an hour have been adopted as a rough estimate of the track and speed of storms crossing the Atlantic, until they arrive off our west coasts, when they are affected by the disposition of pressure over western Europe.

The distribution of pressure over western Europe has been low in the north and high in the south since August 29th, and this disposition is favourable for the north-easterly advance of cyclonic systems over these islands from the Atlantic.

(Signed) HENRY TOYNBEE,
Marine Superintendent.

The Committee resolved it would be prudent at the outset to restrict the telegrams to information received from the largest steamers arriving at New York and Boston, and that messages should be limited to occasions on which the wind force rose to 7 by Beaufort scale, or upwards, with cyclonic change of direction, and that the meridian of 45° W. should be the line eastward of which the weather need not be reported, and that latitude need not be reported.

The telegrams might be drawn up somewhat in the following form :—

From to

Twenty-three (23).—Signifying the 23rd day of the current month as that to which the observation refers.

Eleven (11).—Signifying the hour of the day according to the civil day as usually recorded in logs, but running on from 0 to 23 hours.

Sixty-five (65).—Signifying the longitude.

29 · 4.—Signifying barometer reading, being the lowest reading immediately following or preceding the change of wind direction.

3 . 6.—Signifying change of wind direction from S.E. to W., the points being indicated from N. by E., S., and W., by the figures 0 to 7. Or the points may be indicated by letters.

10.—Signifying wind force on Beaufort's scale.

Ice.—If icebergs are met with.

Twenty-three,	Eleven,	Sixty-five,	294,	Thirty-six,	Ten,	Ice,
(1)	(2)	(3)	(4)	(5)	(6)	(7)

The above, it is understood, would be sent as *seven* words, to which *two* must be added for the address, making nine in all.

The cost of this would be 4*s.* 6*d.* per message. To this would be added the charge of the English Post Office, 1*s.*, or in all 5*s.* 6*d.* If the cost of sending the message to France, to M. Mascart, be reckoned at 2½*d.* per word, it would make the total cost 7*s.* 4½*d.*, and the half share to be paid by each country would be 3*s.* 8¼*d.* daily for one message, or not more than 70*l.* yearly.

(Signed) R. STRACHEY,
Chairman.

Read—Letter 1707 from M. Mascart. Mr. Scott was instructed to inform him that the whole cost of transmission would be divided equally between his office and the Council (P.C. 2421).

Read—The following letter :—

(M.O. 2371.)

Chemical Laboratory,
St. Bartholomew's Hospital, E.C.,
October 28, 1884.

GENTLEMEN,

As you have done me the honour of publishing the two papers, one on London rain, and the other on the amount of carbonic acid in London air, which I communicated to you, I feel that to prevent any wrong impression arising with regard to the continuation of these investigations, I should state to the Council, that, I do not purpose on my own responsibility continuing them. I have, after the expenditure of much time, made a tolerably complete series of experiments, extending over more than two years, and have shown the general bearings of the subject, consequently I am not inclined to continue the mere accumulation of data. With regard to the fog experiments, on the other hand, I hope to continue them, and hope I may shortly have opportunity for so doing. The difficulties met with in this investigation have been considerably more formidable than I expected, but I have, I believe, now an accurate and satisfactory method of estimating the carbonaceous and nitrogenous matters in the air, and in fact I have on several occasions determined the amount in both fine and dull weather. The mechanical washing of the air, so as to obtain an accurate knowledge of the impurities which it contains, proves unsatisfactory, and, although I had a method which promised very well, and which I have very reluctantly abandoned, I believe now it is far better to condense moisture out of the air, and analyse it, than to use water through which air has been passed. I am now making experiments in this direction, and have obtained results of considerable interest. I should perhaps mention, in order to complete the history of how matters stand, that in the purchase of apparatus, which I had not in my laboratory, for these different sets of experiments, I have considerably exceeded the grant I received.

I am, &c.

To the Meteorological Council. (Signed) W. J. RUSSELL.

Resolved—That communications be made to Sir F. Abel and Professor Frankland, to ascertain their opinion as to whether the Committee (appointed Minutes, 1880, p. 81) should be continued, or the investigation left in the hands of Dr. Russell.

Read—The following letter:—

(M.O. 2493.) Kew Observatory, Richmond, Surrey,
November 6, 1884.

DEAR MR. SCOTT,

HAVING reported to the Kew Committee at their meeting last week, that inquiries were made of me as to the value of observations with the rain-band spectroscope, which I was unable to reply to, such observations not being carried out here, I was requested to communicate with you, in order that the Meteorological Council may take into consideration the desirability of such observations being made at this Observatory.

In the event of their being wished for, I would suggest the purchase of two or more instruments which should be fitted to proper stands, having altitude and azimuthal motions.

These I would have permanently installed on fixed stands so placed that the spectroscope should at every observation be directed to the same points of the compass and elevations above the horizon, and not directed at random. These stands need only be very roughly graduated, and with a little adaptation would serve well for determinations of cloud movements at the same time, instruments for this purpose being very much wanted.

If desired, I could prepare a drawing of the instrument suggested, and could obtain estimates of the cost of the outfit and observations.

Yours, &c.
(Signed) G. M. WHIPPLE.

R. H. Scott, Esq., F.R.S.,
Secretary, Meteorological Council.

Resolved—That it is desirable that some experiments be made at Kew in reference to the spectroscopic observation of the rain band, and that Professor Stokes be requested to select and purchase an instrument of the form he considers best adapted to the purpose.

Mr. Scott inquired as to the possible participation of the Office in the Inventions Exhibition (Letter 2147).

Resolved—That the Office should ask for space, and that Mr. Scott be instructed to consider how much space could be used with advantage, and to apply accordingly.

Submitted—A revised proof of Mr. Abercromby's "Principles of Forecasting by Means of Weather Charts" (Minutes, 1883, p. 99), with a letter (No. 1719) from the author's brother, the Hon. John Abercromby, stating that the author was incapacitated from work at present.

Mr. Stone was requested to look over the book before it is sent forward for press.

Submitted—The following report, prepared by Captain Toynbee's directions, for the information of the Council:—

October 28, 1884.

SIR,

I BEG to hand you a statement of the present stage of the North Atlantic Charts for the 13 months, August 1st, 1882, to August 31st, 1883:—

Date of Chart.	Ready for Reduction.*	Observations plotted.	Isobars drawn.	Isotherms drawn.	Weather generalized.	Winds generalized.	Finally examined.	Days' Work of one Person's Time before ready for Reduction.
1882.								
AUG.	1–24	All.	All.	All.	1–24	1–24	1–24	10
SEPT.	1–7	All.	All.	All.	1–13	1–13	1–7	35
OCT.	1–6	All.	All.	All.	1–6	1–6	1–6	36
NOV.	None.	All.	All.	All.	None.	None.	None.	43
DEC.	None.	All.	All.	All.	None.	None.	None.	50
1883.								
JAN.	None.	All.	None.	All.	None.	None.	None.	100
FEB.	None.	All.	None.	None.	None.	None.	None.	112
MAR.	None.	All.	None.	None.	None.	None.	None.	192
APRIL	None.	Two-thirds completed.	None.	None.	None.	None.	None.	212
MAY	None.	Only just commenced.	None.	None.	None.	None.	None.	290
JUNE	None.	None.	None.	None.	None.	None.	None.	280
JULY	None.	None.	None.	None.	None.	None.	None.	290
AUG.	None.	None.	None.	None.	None.	None.	None.	290

* "Reduction" means transferring the data from each working chart to two small charts.

Both the sea and land observations are now, with a very few exceptions, ready for plotting, so that the clerk-power hitherto engaged on "preparing" is free for other branches of the work.

The work given in the table is independent of my own time, which is almost wholly given to the supervision and revision of work, nor does it include the time occupied by yourself in the final examination.

We now have the time of eight clerks available for this branch of work, and since the work remaining to be done will occupy in all about 1,940 days of one person's time, it will occupy the united staff 243 days, or nearly 10 months. This is quite independent of the *reduction* of charts.

As the work has advanced, the experience gained has allowed improvements to be made effecting much saving of time. There is yet another saving which might be effected if it were permissible for the eidograph reductions of isobars and isotherms to be made direct from the tracings without the transferring of these lines to the original chart; this modification alone would effect a saving of six months of one person's time on the work yet remaining to be done.

In framing the above estimate only three female clerks have been considered available—there were originally five—one left December 15th, 1883, and the vacancy has not been filled up; another is so ill that she is not at all likely to return. The plotting of the data is now so far advanced that perhaps it is not necessary to appoint another female clerk.

This estimate is solely dependent upon the staff being kept steadily on this work; and also upon the supposition that the charts, as we are now producing them, are complete. Proper provision has, however, been made for the continuance of the ordinary routine work, such as the examination of new logs, and the indexing of data in ocean ten-degree squares.

The Marine Superintendent. (Signed) CHAS. HARDING.

Forwarded for the information of the Council,

(Signed) HENRY TOYNBEE,

November 12, 1884. Marine Superintendent.

Submitted—The following report:—

SIR, Meteorological Office, September 30, 1884.

I HAVE the honour to report, for the information of the Council, on the work which has been done for the quarter ending 30th September 1884.

The mean pressure charts of the Atlantic, Pacific, and Indian Oceans for the month of May, referred to in my last report (Minutes, July 8th, 1884), have been completed, and two small scale charts have been drawn, showing the lines of equal pressure over the entire globe in the months of May and August.

I have been absent from the Office for 28 days, summer vacation.

I am, &c.

(Signed) C. W. BAILLIE,

The Marine Superintendent. Nav. Lieut. R.N.

Forwarded for the information of the Council.—H. T.

Mr. Scott reported that Mr. Baillie expected to finish his pressure charts for all the oceans by the end of the year, and asked what work the Council wished him to undertake after that date.

Read—A memorandum from Captain Toynbee reporting that since the last meeting 68 logs had been received, 46 of them being "excellent."

Observer.	Ship.	Period.	Voyage.	Last mention on Minutes.
Capt. P. Aldrich, R.N. / Lieut W. Richardson, R.N.	H.M.S. "Sylvia"	May 19—Sept. 19, 1884.	Surveying S.E. coast of Africa.	1882, p. 113. / 1883, p. 117.
Capt. R. J. Balderston.	"Belfast" -	Feb. 14—Oct. 23, 1884.	Liverpool, Calcutta, and home.	1883, p. 99.
Capt. A. E. Barlow	S.S. "Paramatta"	March 27—July 28, 1884.	London, Sydney, Bombay, and home.	1883, p. 136.
Capt. S. H. Bolton -	S.S. "Tyne Queen."	March 20—Aug. 20, 1884.	To Spanish ports (three voyages).	1883, p. 117.
Capt. F. B. Bouchette	S.S. "Montreal"	April 18—Nov. 3, 1884.	Liverpool, Quebec (five voyages).	1883, p. 136.
Capt. G. Burton -	S.S. "British Prince."	Feb. 28—Sept. 2, 1884.	Liverpool, Philadelphia (five voyages).	—
Capt. J. Clarke, R.N.R.	S.S. "Olbers" -	Jan. 20—July 28, 1884.	Liverpool, Brazil, New York, and home.	1883, p. 108.
Capt. W. C. Crutchley, R.N.R.	S.S. "Ruapehu"	May 31—Sept. 9, 1884.	New Zealand, viâ Cape of Good Hope, and home viâ Cape Horn.	1883, p. 30.
Capt. L. C. Dart -	"Alcester" -	Nov. 27, 1883—Sept. 12, 1884.	Glasgow to Rangoon and home.	1883, p. 54.
Capt. W. Deuchars -	S.S. "Jan Mayen"	Feb. 14—Sept. 24, 1884.	Greenland - -	1883, p. 54.

Observer.	Ship.	Period.	Voyage.	Last mention on Minutes.
Capt. R. A. Donaldson.	S.S. "Glenavon"	March 23—Sept 1, 1884.	London, Japan, New York, and home.	—
Lieut.-Com. H. H. Dyke, R.N. / Sub-Lieut. W. Richardson, R.N.	H.M.S. "Sylvia"	Jan. 17—May 19, 1884.	Surveying Magellan Straits, &c.	— / See p. 48.
Capt. T. England	Barque "Jane"	Feb. 2—July 13, 1884.	Liverpool, Apalachicola, and home.	1883, p. 99.
Capt. D. Gray	S.S. "Eclipse"	March 12—Aug. 17, 1884.	Greenland	1883, p. 54.
Capt. E. Halley	"City of Madras"	Nov. 27, 1883—Aug. 4, 1884.	Liverpool, Rangoon, and home.	—
Capt. J. P. Holdich, R.N.R.	"British Envoy"	Dec. 5, 1883—July 16, 1884.	Liverpool, Melbourne, and home.	1883, p. 54.
Capt. J. Holloway	S.S. "Bombay"	April 27—Sept. 2, 1884.	London, New Zealand, and home.	1884, p. 8.
Capt. W. P. Hughes	"Laomene"	Sept. 20, 1883—Sept. 4, 1884.	Cardiff, Mauritius, Walaroo, and home.	1883, p. 54.
Capt. A. W. Jeffery, F.R. Met. Soc.	S.S. "Teniers"	April 16—July 25, 1884.	Antwerp, Rio Janeiro, New York, and home.	1884, p. 3.
Capt. S. Griff Jones	Barque "Hermine."	Aug. 4, 1883—Oct. 22, 1884.	Hull, W. coast of S. America, and Queenstown.	1883, p. 30.
Capt. A. Kellett	S.S. "Calabria"	June 3—July 17, 1884.	To and from Fernando de Noronha.	—
Capt. W. N. Lailey	S.S. "Derwent"	March 10—July 25, 1884.	Brindisi, Cronstadt, &c.	1883, p. 117.
Capt. J. Lawson	S.S. "Humber"	July 11—Oct. 9, 1883.	Southampton to West Indies and home.	1884, p. 35.
Capt. J. F. L. P. Maclear, R.N. / Lieut. W. V. Howard, R.N.	H.M.S. "Flying Fish."	Jan. 1—April 17, 1884.	Surveying China Station	1882, p. 42. / —
Capt. H. Manning	S.S. "Seine"	June 23—July 30, 1884.	To and from Singapore	1884, p. 20.
Capt. W. F. Milne	S.S. "Esquimaux."	Feb. 2—Sept. 21, 1884.	Greenland	1883, p. 78.
Capt. A. Murray	S.S. "Windward."	Feb. 28—Aug. 21, 1884.	Greenland	1883, p. 54.
Capt. F. Norman	Barque "Polestar."	Nov. 28, 1883—July 24, 1884.	Liverpool and Valparaiso and home.	1883, p. 66.
Capt. J. Pagan	S.S. "Tenasserim."	March 16—June 13. 1884.	Liverpool, Rangoon, and home.	1883, p. 99.
Capt. G. F. Parson	"Earnock"	Dec. 16, 1883—Aug. 25, 1884.	London, Adelaide, and home.	1883, p. 54.
Capt. J. C. Prout	"Cape St. Vincent."	Oct. 19, 1883—Aug. 10, 1884.	London, Cape, Java, and home.	1883, p, 54.
Capt. W. Randall	"Dynomene"	Sept. 15, 1883—July 28, 1884.	Liverpool, Calcutta, and New York.	1881, p. 77.
Capt. W. L. Rossiter	Barque "St. Kilda."	March 23—July 26, 1884.	London, Demerara, and home.	1883, p. 108.
Capt. C. J. Russell	"Candahar"	Oct. 20, 1883—April 3, 1884.	Liverpool, Calcutta, and home.	1883, p. 54.
Capt. W. Scott	Barque "Commewyne."	Feb. 7—July 25, 1884.	Glasgow, Surinam, and home.	1883, p. 101.
Capt. J. Seymour; Mr. R. Ladd, F.R. Met. Soc.	S.S. "Scotia"	June 7—Aug. 4, 1884.	Pernambuco and home	1880, p. 16. / 1884, p. 20.
Capt. J. H. Stiven	"Arethusa"	July 12, 1883—July 31, 1884.	Liverpool, Bombay, Akyab, and home.	1883, p. 36.
Capt. H. de la Cour Travers.	S.S. "Tartar"	Feb. 22—July 15, 1884.	Plymouth to Cape of Good Hope, two voyages.	—
Capt. S. Trott	S.S. "Minia"	May 4—Aug. 31, 1884.	Cable laying, near Newfoundland.	1884, p. 25.
Capt. A. McLean Wait.	S.S. "Spartan"	June 20—Sept. 12, 1884.	Cape and home	1884, p. 25.
Capt. H. Walker	S.S. "Cephalonia"	Jan. 6—July 6, 1884.	New York and home, three voyages; Boston and home, two voyages.	1883, p. 90.
Capt. N. J. Wheaton	"Eliza"	Feb. 1—Aug. 7, 1884.	Liverpool, Pernambuco, Barbados, London.	—
Capt. E. White	"Marathon"	Feb. 22, 1883—May 6, 1884.	Cardiff to Singapore, Valparaiso, Huanillos, and home.	—

Observer.	Ship.	Period.	Voyage.	Last mention on Minutes.
Capt. H. P. Wight -	"Oamaru" -	Oct. 13, 1883—June 30, 1884.	London, New Zealand, and home.	1883, p. 55.
Capt. W. Wilson -	Barquentine "Horsa."	July 30, 1883—June 2, 1884.	Cardiff, Java, and home.	—
Capt. H. Youlden -	Barque "May Hulse."	Sept. 14, 1883—Aug. 29, 1884.	Hull, Valparaiso, and home.	1883, p. 55.

Mr. Scott was instructed to present the Charts (O. 27) to Captains Donaldson, Kellett, Wheaton, White, and Wilson, and to Lieutenants Dyke and Howard; (O. 32) to Captain Burton; (O. 43) to Captains Halley and Travers; and to convey the best thanks of the Council to the other observers.

Submitted—The following reports:—

INSPECTION TOUR 1884.

Falmouth.—On August 2nd I visited the plot of ground designed for the site of the new observatory, and met several members of the Committee of the Polytechnic there.

By request, I checked, by means of my azimuth compass, the bearings of the lines laid down for the building preliminary to the excavation of the trenches for the foundations.

I dismounted, cleaned, and examined the anemograph, fitted new pricker, and tightened up a loose fan, oriented it by compass and by mark. I dismounted, cleaned, and examined barograph and thermograph, and improved the focus of the wet bulb, and compared the thermometers with the standard.

I found the Beckley rain gauge in good order, the shake in the trace being due to a defective fitting of the pencil, the holder being too small to hold a pencil unless it is carefully trimmed to shape. It has not been found practicable to adopt the suggestion I made on my last inspection as to the removal of the spare gauge. It would be very desirable to supply a second gauge to run at the new observatory some time before the present one is dismounted.

Valencia.—Immediately on my arrival, August 14th, I had the new anemograph unpacked and made arrangements for erecting it. The weather being uncertain at this station, I proceeded at once to dismount the old instrument. This being done, it became stormy, and we were unable to put the other up for several days. On August 20th it was completed, and having been oriented carefully by a solar observation, was set to work. The barograph and thermograph were examined and cleaned, being in good order, and the thermometers were compared with the standard. The Beckley rain gauge was also found to be in good condition.

A box chronometer formerly in use at the Armagh Observatory was conveyed by me to this observatory and deposited with Mr. Cullum for use as a standard time-keeper, the observations hitherto being controlled by means of an ordinary watch set from time to time by means of the clock at the Anglo-American Telegraphic Station-house.

Armagh.—This observatory no longer being one of the self-recording observatories of the Meteorological Council, Dr. Dreyer, the director, was desirous of having the instruments dismounted and packed away in order to avoid incurring the risk of their accidental injury or destruction. I accordingly dismounted the barograph and thermograph, carefully packing and securing the various pieces of apparatus in order that they might be stored away or forwarded to any place where the Council might decide upon their being deposited either for storage or further use.

The anemograph and Beckley rain gauge, being retained in operation, were examined and found to be in good order.

Holyhead.—Both the bridled and Beckley anemographs were examined. Tha former instrument was undergoing slight repair at the time of my visit, the top plate of the instrument being re-adjusted on the roof of the hut which protects it, on account of its position having become a little shifted by warping of the roof.

The Beckley anemograph was in good order, with the exception of the velocity pencil, which being indented in one place, caused an irregularity to appear in the trace whenever the defective portion came into contact with the recording cylinder. This I in a great measure rectified, by bending the pencil spiral and grinding the indented portion down. In fitting the instrument together, I inadvertently exchanged the cross clutches of the two recording pencils. Some days after my inspection this caused the instrument to fail during a brisk wind, but Mr. Williams, C.E., who has charge of both anemographs, detected the source of failure and replaced the clutches in their proper fittings. Since then the instrument has worked correctly. I examined the orientation and found it was properly performed by the man in charge.

Oxford.—The Radcliffe Observatory was visited on September 3rd. All the instruments were examined and found to be in excellent order. The thermometers were compared and found to require the following corrections:—

Dry bulb standard — $0^{\circ}\cdot5$ Max. + $0^{\circ}\cdot2$
Wet „ — 0·4 Min. + 0·1.

The sunshine recorder did not appear quite firmly fixed in its place, but Mr. Stone promised to rectify it on the first opportunity occurring.

(Signed) G. M. WHIPPLE.

October 1884.

Aberdeen (visited by Mr. Baker on September 17, 18, 19).—All the instruments at this observatory were found in capital working order and the photography was good.

I thought it advisable, however, to entirely dismount the thermograph clock, as the oil had become somewhat thick, but as regards the barograph clock, only parts required cleaning, besides a general oiling.

The lenses and condensers of both instruments were carefully wiped.

The exposed parts of the anemograph were dismounted and thoroughly examined and oiled, but the clock did not require cleaning, having quite recently been taken down for the purpose of attaching a new clock line, when it was thoroughly cleaned.

Afterwards the orientation was examined, and the result is appended to this report.

The rain gauge was generally cleaned.

The standard dry and wet bulb thermometers were compared with a Kew standard thermometer in water at a temperature of 60 degrees, and the following corrections were derived from a mean of four readings:—

Dry, No. 458.	Wet Bulb, 395.
− 0°·05	− 0°·6

Mr. Boswell having called my attention to the fact that there was a difference of some two or three tenths of a degree between the above corrections and those determined by Mr. Buchan during the week preceding my visit, we thought it well to compare the maximum and minimum in use in the thermograph screen as well as all the thermometers mounted in the Stevenson screen. These were all tested in water with the following results:—

MAXIMUM and MINIMUM used in THERMOGRAPH SCREEN.

Kew Standard, No. 571. Mean of 4 readings.	Maximum M.O. 48.		Minimum M.O. 89.	
	Mean of 4 readings.	Correction.	Mean of 4 readings.	Correction.
59°·2	59°·8	−0°·6	—	—
59·2	- - -	- - -	59·0	+0·2*

Tested September 19.

THERMOMETERS employed in the STEVENSON SCREEN, situated in the Garden.

Kew Standard, No. 571. Mean of 4 readings.	B.T. 1755.		B.T. 1756.		Maximum 257.		Minimum M.O. 766.	
	Mean of 4 readings.	Correction.	Mean of 4 readings.	Correction.	Mean of 4 readings.	Correction.	Mean of 4 readings.	Correction.
59°·25	59°·55	−0°·3	—	—	—	—	—	—
59·30	- -	- -	59·6	−0·3	—	—	—	—
59·30	- -	- -	- -	- -	59·7	−0·4	—	—
59·30	- -	- -	- -	- -	- -	- -	59·6	−0·3

The above comparisons indicate a constant difference of 0·2 higher than those of Mr. Buchan, which is most probably due to a difference between the two standard thermometers employed in the examination.

The Kew standard of reference was again compared with the observatory standard on my return to Kew, and found to be unchanged,

(Signed) T. W. BAKER.

October 1884.

* This correction is some three-tenths less than the one used by Mr. Boswell, but I carefully examined the chamber, and could not detect any spirit detached from the main column. To make certain, however, the chamber was warmed over a gas burner and afterwards the thermometer placed in a vertical position for about an hour, when it was recompared, but the above correction had not changed.

Report on the Irish and Welsh Stations for 1884.

I have to report that I have completed the inspection of the Irish and some of the Welsh Stations.

Telegraphic Reporting Stations.

St. Ann's Head (visited August 20th).—This station calls for no remark.

Parsonstown (visited August 27th).—This station continues very satisfactory, except in the arrangements for observing, the observers being two clerks in land agent's offices, one of whom takes the telegraphic and the other the second order (climatological) observations. It is very desirable that a better system should be introduced.

Belmullet (visited September 10th).—I found that the observer, J. Gibbons, appointed to this station was quite incompetent, so I at once removed him and appointed Miss Mary Tolan, the telegraph clerk, as reporter; she seemed very steady and intelligent, and learned the duty of reporting very quickly. The exposure of the thermometers and rain gauge is not improved by the change, as they are now in a garden and not on the open hill side, but I think the arrangement I made is the only one possible. It appears to work well, and the observations have been published since October 1st.

Valencia (visited September 25th).—There is nothing to remark as to the telegraphic reports.

Roche's Point (visited September 26th).—The station was in good order.

Donaghadee (visited October 1st).—There is nothing further to report about this station, which continues quite satisfactory.

Mullaghmore (visited October 3rd).—This station is in good order. It is not yet certain whether Mr. Kerr can continue at Mullaghmore after the close of the current year.

Malin Head (visited October 8th and 9th).—This station is extremely well exposed. It is a signal tower situated on an isolated hill 226 feet high, close to the coast. The sea is visible except between east and south. There are no mountains near to divert the wind.

One barometer is placed in the tower, the other in the observer's bedroom at Slievebawn, distant two miles from the tower. The rain gauge and thermometer screen are placed on the hill top near the tower. The observer is Lloyd's signalman, P. Farren; he is not well educated, but seems quick at learning his duties. He is now being trained by correspondence, and it is hoped that his reports will soon be sufficiently good to publish.

Holyhead (visited October 13th).—The reporter at this station (Caleb Durham) has only recently been appointed. He will, I think, make a good observer. The instruments are in good order.

Stations for the Weekly Weather Report.

Llandovery (visited August 19th).—This is a new station. The observer is Mr. Jonah Watkins, Bank manager. The site is not very good, as the only space available is that of a small garden. The instruments are not of high quality.

Waterford, Brook Lawn (visited August 22nd).—This is also a new station. The observer is Mr. C. P. Bolton, F.R.Met.Soc. The instruments are good and well exposed, and there is good hope of the station being a permanent one.

Kilkenny, The Castle (visited August 23rd).—This is also a new station, established by the Marquis of Ormonde, who is himself the observer when at home. The arrangements are all satisfactory. I have hopes that this station may become one of the second order.

Foynes, Mount Trenchard (visited September 23rd).—This station continues in the same condition. The observer cannot find a substitute when he is occasionally absent.

Killarney (visited September 26th).—This is a new station situated about a mile from the town. The observer is the Rev. G. Robert Wynne, F.R.Met.Soc. The instruments are of good quality, and the exposure good, except for wind, which is much affected by the proximity of mountains.

Second Order Stations.

St. David's (visited August 21st).—This station was, as usual, in very good order. The thermometers and rain gauge had at the date of my visit been temporarily placed in a garden, but were very shortly to be moved to a site in an open field.

Galway (visited August 29th).—This is a station which I hope may be made a climatological one. The observer is W. Ryan, assistant to Professor Larmour, Professor of Physics at the Queen's College. The observations are carefully taken, but the exposure of thermometers and rain gauge is not good, being in a garden with many fruit trees in it. The instruments are good.

Dublin, Fitzwilliam Square (visited September 27th).—This station continues as satisfactory as it is possible for a town station, with a limited garden exposure, to be.

Dublin, Glasnevin (visited September 30th).—The observations are very well taken, and the station in good order.

Dublin, Mountjoy Barracks (visited October 11th).—The new scaffolding for the anemometer and sunshine recorder has been erected. The station is in complete order.

Colebrooke (visited October 2nd).—This station is in good condition, but some doubt exists as to its height above sea level, which inquiry at the Ordnance Survey Office at Mountjoy Barracks failed to remove. It will be necessary to have the ground re-levelled for a distance of about two miles from the nearest Ordnance Bench Marks.

Markree (visited October 4th.—This station is in good order, Mr. Marth taking much interest in the work. He has, however, no assistant at present.

Londonderry (visited October 7th).—This station is in a fairly good condition. The observer, J. Conroy, was absent on the day of my visit, but his son was quite competent to act as his substitute.

Observatories.

Valencia (visited September 25th).—The new anemometer has been put up, and works quite satisfactorily. The other instruments continue in good order.

I find that a new gate is required for the yard, and some other minor repairs were ordered to be taken in hand.

If the Council contemplate the erection of an electrical anemometer, it will be necessary to bear in mind that the Post Office telegraphic linesman lives at Rossbeigh, at a distance of over 20 miles from the island.

Armagh (visited October 2nd).—The photographic self-recording apparatus at this station has been packed up by Mr. Whipple awaiting the decision of the Council as to its disposal. It will be necessary to supply some instruments to the observatory to enable Dr. Dreyer to carry on his observations. I submit the inventory of the property of the Council now at Armagh, (Lr. 2358, 1884), and have to ask for instructions about it.

Thermometers.

The following table gives the results of comparisons made with Inspector's standard No. 3,349, and the thermometers at the different stations, the readings of the standard being corrected for instrumental errors, none of the Kew corrections for the station thermometers, however, being allowed for:—

Stations.	Dry Bulb.	Wet Bulb.	Max.	Min.	Spare Therm.	Notes.
	°	°	°	°	°	
Colebrooke	−0·3	+0·2	+0·1	+0·2	—	
Dublin (City)	−0·3	−0·3	−0·8	+0·2	—	
Dublin (Phœnix Park)	−0·8	−0·3	−0·3	0·0	−0·5	Grass min.—0°·1.
Glasnevin	+0·1	−0·2	−0·5	+0·7	—	Grass min.+1°·7.
Londonderry	−0·4	−0·4	−1·0	+0·2	−0·2	
Markree Castle	−0·1	−0·1	+0·1	+0·1	—	
Parsonstown	−0·6	−0·4	−0·2	+0·4	—	
St. Davids	−0·2	−0·3	+0·3	−0·2	—	Grass min.—0°·1.

←	Dry Bulb.	Wet Bulb.	Max.	Min.	Spare.	Remarks.
Telegraphic Reporting Stations.						
	°	°	°	°	°	
Donaghadee	−·1	+·3	−·1	−·5	—	
Mullaghmore	−·3	−·2	+·1	−·2	− ·1	
Parsonstown	+·6	+·4	−·1	−·3	—	
Valencia	+·4	+·4	+·9	−·2	+ ·8	
Roche's Point	+·3	+·3	+·9	−·8	—	
Holyhead	+·4	+·2	+·3	0	+1·0	
Pembroke	+·6	+·5	−·3	+·1	+ ·5	
Weekly Weather Report Stations.						
Foynes	+·4	+·4	+·4	− ·4	—	Wet bulb was too wet,
Galway	+·3	0	−·2	−1·0	—	glass too near bulb.
Waterford	+·2	+·3	+1·2	− ·3	—	Grass min.—0°·5.

(Signed) Robert H. Scott.

Report on the English Meteorological Stations for 1884.

The state of my health precluding me from taking the whole work of inspection this year, Mr. D. Wilson Barker, F.R. Met. Soc., undertook a large portion of the task for me, and was, at my recommendation, appointed deputy inspector of the stations in the north and east of England for this year.

His report is as follows:—

Report on the Telegraphic Reporting Stations, 1884.

Brixton.—Everything in excellent condition, and observations taken regularly.

Loughborough.—All instruments in excellent order and carefully attended to. The position of screen is not very good, being in a garden with wall round. No better place is available.

Liverpool.—I tested the observatory standard thermometer with which the other thermometers (used for reporting) are frequently tested, and they only differed 0°·1.

Barrow-in-Furness.—All instruments clean and in good order, and are well attended to. But the position of the screen is bad, partly surrounded by shrubs, and facing a wall.

N. Shields.—The screen has been shifted nearer edge of square since last inspection, but this will not affect the results much. The wind's direction has always been reported as magnetic, under the impression that it was true direction. Rain-gauge rim rather out of order. Other instruments clean.

York.—The position of the instruments here is fairly good, the screen being somewhat sheltered by large trees. Observations are taken by one of the gardeners employed in the grounds, and are somewhat rough.

Spurn Point.—Since the last inspection the screen has been turned round, as directed by Mr. Ley, and now faces N.N.W. (true). All instruments in good order, and observations carefully attended to.

Yarmouth.—All instruments clean and in good order. The screen is not well placed, having its back resting against a wall, but it faces N. ½ E. (true). The position cannot well be altered.

Cambridge.—Instruments clean and in good order. Screen somewhat sheltered by shrubs.

Report on the Second Order Stations, 1884.

Chatham.—The observers take a good deal of trouble over the observations, but owing to the school duties, they are liable to be interrupted, and the instruments, though in good positions, are scattered. The screen faces in a southerly direction. Wet bulb very foul.

Leicester.—Instruments clean and in good order. The vane used for reporting the direction of wind points magnetic.

Sheffield, Weston Park.—This is a new and good station. The instruments have a good exposure, but the screen is painted green, the Museum Committee objecting to the white paint. The observer, living some distance from the Museum, finds it difficult to attend to the evening observations. A wooden frame barometer is in use, but the Museum Committee might procure a proper instrument if the Council proposed it to them, as the observations would then be much more valuable. Suitable station for an anemometer.

Prestwich.—Instruments in good position, clean, and well attended to.

Isle of Man, Cronkbourne.—This is an excellent station. All instruments in good order, and great care taken with the observations.

Peel.—Since the last inspection the instruments have been shifted, and are now in a yard at the back of the observer's house. The position is not very good. The observations are carefully taken. The instruments all clean. If the screen could be moved on to a grass plot on one side of the house it would be better.

Newton Reigny.—A new and excellent station, in charge of a careful observer. Everything in perfect order.

Aysgarth.—Everything in excellent order.

Durham.—The rain gauge shaky. All other instruments clean and in good order.

Seaham.—Instruments in good order. Screen shaky, and sheltered a little by shrubs. The anemometer works very well.

York.—The position of the instruments here is fairly good; screen is somewhat sheltered by trees. Observations rather rough, especially wind direction. Gave some directions relating to this and weather.

Geldeston.—Solar radiation thermometer out of order. All other instruments in excellent order. Allowances are made for error in solar radiation thermometer. Observations very carefully taken.

Saffron Walden.—Instruments clean and in good order. A new wet-bulb thermometer has been in use since last inspection. From the position of this station, on a gently sloping hill, the wind's direction will not show truly for the neighbourhood. The observer having no assistants, and his time much occupied, finds it impossible to get observations at times.

Oscott.—It being vacation time the observer was absent, and the gardener takes the thermometer readings. No one there could read the barometer correctly. Position of instruments good, and it is to be regretted that the observations cannot be kept up properly.

Stokesay.—The screen has been shifted since last inspection, as suggested by Mr. Ley, and now faces E.N.E. (true). The barometer is much out, reading ·054 higher than the standard instrument. The observations are well attended to.

Weekly Weather Reporting Stations, 1884.

Alnwick.—Observations taken regularly. The thermometers are of Six's pattern, fitted in a window about 21 feet from the ground. The anemometer gives some extraordinary results, giving great velocity for Southerly and South-westerly wind, and registering small velocities for Northerly winds of apparently the same force. It is situated at the east corner of one of the castle towers, and is no doubt affected by up-drafts. The cups are at far too great a distance from the registering drum to give good results.

Cirencester.—The thermometers used here are unverified and mounted on wood, stems not graduated, but only read 0°·1 different from the standard thermometer; tested in water. This

station is in a good position, and would be very suitable for a Second Order station, if arrangements could be made for the observations to be taken.

(Signed) D. W. BARKER.

I have incorporated the instrumental comparisons made by Mr. Barker with those made by myself in the tables appended to this report.

The following stations in the south and west of England were inspected by me this year :—

(Ley)

TELEGRAPHIC REPORTING STATIONS.

Prawle Point (inspected September 17th).—The observer, Mr. J. John, and, in his occasional absence, the chief boatman, Mr. Kessell, continue to conduct the observations with great care. The instruments were all in excellent order. Gave instructions as to the temporary shifting of the barometers, necessary on account of the re-painting of the room. They have been moved without injury.

Scilly (September 21st to 23rd).—The observer's health some time since broke down, but it has been again restored, and the observations are carefully conducted. Such steps as I was able to take to secure the services of a deputy, should the health of Mr. Thomas fail, have been explained in two letters to the Secretary. The thermometers and barometers were in good order. Portions of the anemometer were somewhat corroded, and the clock, which had stopped on the day of my arrival, much required cleaning, I therefore dismounted the instruments, and with the assistance of a watchmaker from Penzance, cleaned and repaired them, with the exception of the brush of the vane, which is totally worn away. Ordered the exterior of the anemometer case to be re-painted. The traces of the anemograph are still occasionally faint, owing to the salt and moisture. The rain gauge required some slight repairs.

Jersey (visited October 4th).—The observations are faultlessly conducted, and the instruments a e in excellent order.

Hurst Point (visited October 17th).—The instruments were all in good order. Mr. Appleton continues to read the barometers correctly and the thermometers somewhat roughly. The rain gauge required rectifying. The tube and cap of the thermometer screen had gone to pieces, so that rain occasionally found access to the instruments. I had a new tube and cap made at Lymington.

SECOND ORDER and WEEKLY WEATHER REPORTING STATIONS.

Arlington Court (inspected September 16th).—The instruments at this station appear to be very well attended to. The exposure of all of them is most admirable, and I am of opinion that the situation is most favourable for a Second Order station, should Lady Chichester consent to its institution as such.

Totnes (September 18th).—At this station of the Second Order the observations are well conducted, and the records well filled. The position and condition of the instruments are unexceptionable.

Plymouth (inspected September 18th).—The observer, Mr, J. Merrifield, Ph.D., F.R.A.S., conducts the work at this Weekly Weather Reporting station with much care, but the exposure of none of the instruments, excepting the sunshine recorder, is good, and it seems improbable that a better will be obtained.

Helston (September 25th).—The observer, Mr. Gill, who is a schoolmaster, is fairly accurate and painstaking. The observations were interrupted in January and February of this year owing to an outbreak of fever in the observer's house. The barometer, by Casella, is in a brass frame, has not been verified at Kew, but has been compared for a long period with the observatory standard at Falmouth, and has a correction of $+ 0 \cdot 10$ uniform throughout the scale. The field in which the rain gauge has hitherto been placed, having been converted into arable land, the instrument has been shifted into the observer's kitchen garden. It is not here properly exposed, and I should recommend that it be fixed to the summit of a stone pillar at the end of the garden, for, although its rim would thus be more than five feet above the ground, the exposure would be a great deal more satisfactory.

St. Aubin's, Jersey (visited October 6th).—All the instruments at this station were found to be, as usual, in excellent order, and the records are very complete.

Southampton (October 16th).—The utmost care is taken in the observations made at this station, and I found the instruments to be all in the best condition.

St. Leonard's (October 20th).—The observations at this station are carefully taken, and the instruments are well attended to.

St. Edmund's College, Ware (October 20th).—This new station of the Second Order is situated on a hill, and has an excellent exposure. The observer is the Rev. B. Ward, who formerly assisted in taking the observations at Oscott. The barometer, which is in the laboratory of the College, stood close to the fireplace and was too high above the floor to be read with ease. I requested that it should be removed to a more convenient position. The thermometer screen and rain gauge are near the middle of a large lawn on the west or front side of the College. I ordered that the screen should be turned round, so as to open to the north, instead of the south, as it did at the date of my visit. This station promises to be a valuable one, if permanency can be secured.

Cooper's Hill (inspected October 21st).—The instruments of this Second Order station are in excellent condition, but the evening observations are still taken at 3 p.m. instead of at 9 p.m. The barometer, which is a very good instrument, has been verified at Kew since my last inspection.

Harpenden (inspected October 23rd).—At this station of the Second Order the observation books do not seem to be very carefully kept. The mean temperature at this station, after allowance is made for altitude, appear about 1° too low. I am unable to say with precision to what cause this circumstance is due. It is conceivable that this may be partly due to the use of the screen "Stow's No. 2."

Rothamsted (October 23).—At this Weekly Weather reporting station the thermometers are those employed at Harpenden. The rain gauges are in good order and the rainfall records well kept.

Table I. shows the results of the barometric comparisons made this year at the English stations. In Table II. the differences between the observer's and inspector's readings of the thermometers and also the differences between the readings of the thermometers in water and those of the inspector's standards are tabulated. Mr. Barker employed the instrument No. 3,348 as his standard; and I used two thermometers, B. T. 1,314 and Casella 30,523. There was occasionally a trivial difference between the readings of the two latter instruments, and in these instances the mean of the two (corrected) readings is given as that of the standard.

The readings of the inspector's standard barometer employed for the comparisons in Table I. are throughout corrected for index error, those of the reporting and spare barometers uncorrected.

Personal equations can sometimes be determined with considerable accuracy by two or three sets of thermometer readings taken simultaneously by the inspector and observer while the thermometer bulbs are immersed in well-stirred water. No such accuracy is approachable when the readings of four or more instruments in the screen are compared. I would therefore recommend that in the forms of the notes of inspection, columns be devoted only to readings taken when the instruments are immersed, and none to readings taken from the open screen, in which temperatures are rapidly varying.

TABLE I.—BAROMETERS at the ENGLISH STATIONS.

Station.	Reporting Barometer.			Check Barometer.	
	Height of Mercury.	Difference of Observer's from Inspector's Reading.	Error of Instrument as compared with Standard.	Height of Mercury.	Difference of Observer's from Inspector's Reading.
Aysgarth	29·513	+·003	+·012	—	—
Barrow-in-Furness	30·103	—·001	—	30·043	+·008
Brixton	30·127	—·002	—	—	—
Cambridge	30·152	—·004	—	—	—
Chatham	29·915	—·002	—·010	—	—
Cooper's Hill	30·058	—·001	—	—	—
Cronkbourne	30·151	—·001	—	—	—
Durham	29·759	+·001	—·004	—	—
Geldeston	30·187	+·002	—	—	—
Harpenden	29·590	—·010	—	—	—
Helston	30·068	+·001	—	—	—
Hurst Point	30·456	·000	—	30·451	—·001
Jersey	30·368	·000	—	30·371	+·001
Leicester	30·029	—·019	+·030	—	—
Loughborough	30·076	—·002	—	—	—
Newton Reigny	29·571	+·003	—·010	—	—
Oscott	29·665	—	+·006	—	—
Peel	30·076	—	—·004	—	—
Prawle Point	30·037	—·001	—	30·039	—·003
Prestwich	29·749	—·005	—·001	—	—
Saffron Walden	30·023	+·001	—	—	—
St. Aubyn's	30·335	·000	—	—	—
St. Edmund's College	30·022	—·002	—	—	—
St. Leonard's	30·325	+·001	—	—	—
Scilly	30·090	·000	—	30·091	+·001
Seaham	29·892	+·001	+·022	—	—
Sheffield	29·950	+·001	+·009	—	—
Do. Weston Park	29·780	—	—·004	—	—
Shields, N.	29·933	—·001	—	29·931	—·005
Southampton	30·375	·000	—	—	—
Spurn Head	29·981	+·001	—	29·980	+·001
Stokesay	29·984	+·011	+·061	—	—
Yarmouth	30·059	+·001	—	30·046	+·008 ?
York	29·943	+·003	—·001	—	—

TABLE II.—THERMOMETERS at the ENGLISH STATIONS.

STATION.	DATE.	DRY BULB.				WET BULB.				MAXIMUM.				MINIMUM.				SPARE, OR GRASS.			
		Difference of Observer's from Inspector's Readings.	Correction to be applied according to the Inspector's Standard.	Latest Kew Correction.	Temperature of Water according to Reading of Thermometer.	Difference of Observer's from Inspector's Readings.	Correction to be applied according to the Inspector's Standard.	Latest Kew Correction.	Temperature of Water according to Reading of Thermometer.	Difference of Observer's from Inspector's Readings.	Correction to be applied according to the Inspector's Standard.	Latest Kew Correction.	Temperature of Water according to Reading of Thermometer.	Difference of Observer's from Inspector's Readings.	Correction to be applied according to the Inspector's Standard.	Latest Kew Correction.	Temperature of Water according to Reading of Thermometer.	Difference of Observer's from Inspector's Readings.	Correction to be applied according to the Inspector's Standard.	Latest Kew Correction.	Temperature of Water according to Reading of Thermometer.
		D.	C.	K.	T.	D.	C.	K.	T.	D.	C.	K.	T.	D.	C.	K.	T.	D.	C.	K.	T.
Arlington Court	September 16th	—	+ ·05	?	63·2	—	— ·05	?	63·3	—	— ·55	?	63·8	—	+ ·95	?	62·3	—	—	—	—
Aysgarth	August 8th	—	—	—	65·5	—	—	—	65·8	—	—	—	65·7	—	—	—	65·2	—	—	—	65·8
Barrow-in-Furness	August 6th	—	— ·3	?	66·2	—	— ·3	?	66·2	—	+ ·1	?	65·8	—	+ ·1	?	65·8	—	—	—	—
Brixton	July 28th	—	— ·1	—	62·8	—	— ·1	—	62·8	—	+ ·2	—	62·5	—	+ ·1	—	62·6	—	—	—	—
Cambridge	August 16th	—	— ·8	—	67·6	—	— ·7	—	67 5	—	— ·8	—	67·6	—	+ ·5	—	66·3	—	—	—	—
Chatham	July 25th	— ·1	— ·1	— ·1	63·0	+ ·2	— ·8	— ·8	63·8	·0	+ ·6	+ ·1	62·4	·0	·0	— ·1	63·0	·0	— 1·0	?	64·0
Cirencester	August 22nd	—	—	—	—	—	—	—	—	—	— ·2	—	60·2	—	— ·2	—	60·2	—	—	—	—
Cooper's Hill	October 21st	+ ·1	— ·05	— ·2	60·9	·0	— ·05	— ·2	60·9	+ ·1	+ ·15	— ·1	60·7	+ ·1	+ ·45	+ ·2	60·4	+ ·1	+ ·05	— ·1	60·8
Cronkbourne	August 5th	·0	— ·8	·0	66·0	— ·1	— ·1	·0	65·3	+ ·1	— ·2	·0	65·4	·0	+ ·3	+ ·1	64·9	—	·0	?	65·2
Durham	August 9th	—	— 1·2	—	59·7	—	— 1·2	—	59·7	—	— 1·0	—	59·5	—	+ ·5	—	58·0	—	+ ·1	—	58·4
Geldeston	August 15th	·0	— ·3	+ ·2	66·4	·0	— ·7	— ·1	66·8	·0	— ·2	— ·1	66·3	·0	— ·1	— ·1	66·2	—	— ·2	—	66·3
Harpenden	October 23rd	+ ·1	+ ·45	?	52·9	+ ·1	+ ·35	?	52·9	·0	— ·05	?	53·1	+ ·2	+ ·2	?	52·7	—	—	—	—
Helston	September 25th	—	— ·15	?	57·9	—	— ·25	?	58	—	— ·15	?	57·9	—	+ ·45	?	57·3	—	—	—	—
Hurst Point	October 17th	—	+ ·05	—	55·7	—	— ·25	—	56·0	—	+ ·05	—	55·7	—	+ ·65	—	54·9	—	—	—	—
Jersey	October 4th	—	— ·1	?	57·9	—	— ·2	?	58·0	—	— ·1	?	57·9	—	+ ·2	?	57·6	—	—	—	—
Leicester	July 30th	+ ·1	— ·1	?	59·2	+ ·2	— ·1	?	59·2	+ ·2	— ·1	?	59·2	+ ·3	+ ·4	?	58·7	— ·3	+ 2·3	?	56·8
Liverpool	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	— ·25	—	65·35
Loughborough	July 30th	—	— ·8	?	63·7	—	— ·9	?	63·8	—	— ·3	?	63·2	—	— ·1	?	63·0	—	—	—	—
Newton Reigny	August 7th	+ ·1	— 1·0	— 1·5	58·8	·0	— 1·0	— ·4	58·8	·0	— ·8	— ·3	58·6	·0	·0	·0	57·8	·0	+ 2·7	+ ·2	55·1
Oscott	August 20th	·0	— ·7	?	60·4	·0	— ·6	?	60·3	— ·1	— ·3	?	60·0	·0	— ·1	?	59·8	—	—	—	—
Peel	August 5th	— ·1	— ·5	— ·1	59·8	— ·1	— ·3	·0	59·6	— ·1	+ ·2	+ ·1	59·1	·0	+ ·2	·0	59·1	—	—	—	—
Plymouth	September 18th	—	+ ·15	—	67·5	—	+ ·25	?	67·4	—	— ·15	?	67·8	—	+ ·75	?	66·9	—	—	—	—
Prawle Point	September 17th	—	— ·15	—	63·7	—	— ·25	-	63·8	—	— ·15	—	63·7	—	+ ·25	—	63·3	—	+ ·05	—	63·5
Prestwich	August 1st	·0	— ·3	— ·3	81·4	·0	— ·2	— ·3	81·3	·0	— ·1	— ·5	81·2	·0	— ·1	— ·2	81·2	+ ·2	—	·0	—
Rothamsted	October 23rd	—	+ ·45	—	52·5	—	+ ·35	—	52·6	—	— ·05	—	53·0	—	+ ·35	—	52·6	—	+ ·75	—	52·2
Saffron Walden	August 16th	+ ·2	— ·8	?	61·0	·0	— ·8	?	61·0	·0	— ·6	+ ·2	60·8	·0	+ ·2	·0	60·0	+ ·1	—	+ ·2	—
St. Aubyn's	October 6th	·0	+ ·1	?	59·8	+ ·1	+ ·3	?	59·6	·0	+ ·1	?	59·8	·0	+ ·2	?	59·7	·0	·0	?	59·9
St. Edmund's College	October 20th	—	+ ·05	?	54·7	—	— ·05	?	54·8	—	— ·15	?	54·9	—	+ ·25	?	54·5	—	—	—	—
St. Leonard's	October 20th	·0	— ·35	— ·4	55·9	·0	— ·45	— ·4	56·0	·0	·0	+ ·1	56·0	·0	·0	+ ·1	56·0	—	—	—	—
Scilly	September 21st–23rd	—	— ·05	—	61·2	—	+ ·15	—	61·0	—	— ·25	—	61·4	—	+ ·25	—	59·9	—	— ·05	—	61·2
Seaham	August 11th	·0	— ·9	·0	63·8	— ·1	— ·5	·0	63·4	+ ·1	— ·1	·0	63·0	·0	— ·1	·0	63·0	—	—	—	—
Sheffield	July 31st	+ ·1	—	— 1·0	—	·0	—	— ·5	—	—	—	—	—	—	—	—	—	—	—	—	—
Do., Weston Park	July 31st	—	— 1·6	—	66·8	—	— ·2	—	65·4	—	— 1·2	—	66·4	—	·0	—	65·2	—	—	—	—
Shields, N.	August 11th	—	— ·3	?	65·0	—	— ·3	?	65·0	—	— ·1	?	64·8	—	+ ·6	?	64·1	—	—	—	—
Southampton	October 16th	+ ·1	·0	— ·2	52·9	+ ·1	·0	— ·1	52·9	·0	— ·4	— ·6	53·3	·0	+ ·3	— ·1	52·6	·0	+ ·5	·0	52·4
Spurn Head	August 13th	—	— ·4		69·2	—	— ·6		69·4	—	— ·1	?	68·9	—	+ ·1	?	68·7	—	—	—	—
Stokesay	August 21st	— ·1	— ·3	— ·3	54·2	— ·1	— ·4	— ·1	54·3	·0	+ ·3	— ·2	53·6	+ ·2	·0	+ ·3	53·9	— ·3	+ ·2	?	53·7
Totnes	September 18th	— ·1	— ·1	?	67·9	— ·1	— ·1	?	67·9	·0	— ·1	?	67·9	·0	·0	?	67·8	·0	— ·1	?	67·9
Yarmouth	August 14th	—	+ ·1	?	67·0	—	— ·7	?	67·8	—	+ ·1	?	67·0	—	+ 1·1	?	66·0	—	—	—	—
York	August 12th	—	— ·4	?	70·0	—	— ·4	?	70·0	—	— ·6	?	70·2	—	+ ·6	?	69·0	—	—	—	—
York (Second Order)	August 12th	+ ·1	— ·4	?	70·0	·0	— ·4	?	70·0	·0	— ·2	?	69·8	+ ·2	+ ·1	?	69·5	—	—	—	—

(Signed) W. CLEMENT LEY,
November 8th, 1884.

SUBMITTED—The following STATEMENT respecting the RECORDS for December 1882, received from the SELF-RECORDING OBSERVATORIES (see Minutes, 21st December 1868 and 20th November 1876).

—	Aberdeen.		Armagh.		Falmouth.		Glasgow.		Kew.		Stonyhurst.		Valencia.	
ANEMOGRAPH :—	Direction. Good.	Velocity. Good.	Direction. Good.	Velocity. Good.	Direction. Good.	Velocity. Good.	Direction. Good.	Velocity. Good.	Direction. Good.	Velocity. Good.	Direction. Good.	Velocity. Good.	Direction. Good.	Velocity. Good.
Action														
Records deficient, due to stoppage of clock	0	0	0	0	2	2	0	0	0	0	0	0	0	0
„ „ other causes	0	0	0	0	0	0	0	0	†46	†76	0	†26	0	0
Orientation verified	30th	—	30th	—	14th	—	5th, 30th	—	4th	—	21st	—	11th	—
No. of errors discovered by subsidiaries	0	0	0	0	0	0	0	0	0	0	0	0	0	0
„ „ irregular differences	0	3	2	0	0	3	6	4	3	1	2	24	1	8
Result of 40 *Remeasurements* :—														
Greatest difference	2·0	2·0	0·0	2·0	0·0	1·0	1·0	1·0	1·0	1·0	1·0	1·0	0·0	2·0
Mean difference irrespective of sign	0·1	0·5	0·0	0·5	0·0	0·4	0·0	0·3	0·0	0·4	0·1	0·6	0·0	0·6
Residual difference (—Meteorological Office)	+0·1	0·0	0·0	0·0	0·0	0·0	0·0	−0·1	0·0	+0·1	+0·1	+0·1	0·0	−0·1
RAIN GAUGE :—														
Action	Good.		Good.		Fair.		Good.		Good.		Good.		Good.	
Records deficient, due to stoppage of clock	0		0		0		0		0		0		0	
„ „ other causes	*114		0		0		0		*36		*8		0	
Errors in tabulation	0		0		2		9		1		6		0	

BAROGRAPH :—																			
Action							Good.		Good.		Good.		Good.		Good.		Good.		Good.
Photography							Do.		Do.		Do.		Bad.		Do.		Fair.		Do.
Records deficient, due to stoppage of clock							0		0		0		0		0		0		0
,, ,, failure of light							0		0		0		0		21 hrs.		0		0
,, ,, other causes							0		0		0		0		0		‡12 hrs.		0
No. of errors discovered—																			
In entry of standard							0		2		1		0		5		21		2
,, calculating residual correction							0		0		1		4		2		3		0
,, applying residual correction							1		0		1		27		0		16		0
,, subtraction in subsidiary tables							0		0		0		0		2		1		4
,, tabulation by subsidiaries							0		0		0		0		0		0		0
,, ,, irregular differences							0		1		4		1		0		17		14
Result of 40 *Remeasurements :—*																			
Greatest difference							·005		·008		·009		·008		·005		·010		·007
Mean difference irrespective of sign							·002		·003		·003		·002		·002		·003		·002
Residual difference (— Meteorological Office)							—·002		·000		+·001		·000		·000		·000		—·001
Mean monthly difference between simultaneous barograph and barometer readings							·002		·002		·001		·002		·002		·001		·002
THERMOGRAPH :—																			
Action							Good.		Good.		Good.		Good.		Good.		Good.		Good.
Photography							Do.		Do.		Do.		Bad.		Do.		Do.		Do.
							Dry.	Wet.	Dry.	Wet.	Dry.	Wet.	Dry.	Wet.	Dry.	Wet.	Dry.	Wet.	Dry.	Wet.
Records deficient, due to stoppage of clock							0	0	0	0	0	0	0	0	0	0	0	0	0	0
,, ,, failure of light							0	0	0	0	0	0	0	0	0	0	0	6	0	0
,, ,, imperfectly moistened bulbs							—	5	—	0	—	0	—	188	—	0	—	8	—	0
,, ,, partially frozen bulbs							—	39	—	5	—	5	—	22	—	26	—	24	—	21
,, ,, other causes							§19 0	§17 ¶1	0	0	0	0	‖11	‖11	**2	**1	0	‡3	0	0
No. of errors discovered in entry of standard							0	0	5	4	0	0	0	0	0	1	0	3	0	0
,, ,, by subsidiary measurements							0	0	0	0	0	0	0	0	0	0	0	0	0	0
,, ,, of subtraction in do. tables							0	0	2	0	3	1	1	0	5	11	2	1	1	0
,, ,, detected under glass scale							0	0	0	0	0	2	1	0	1	0	0	0	0	0
Result of 40 *Remeasurements :—*																			
Greatest difference							0·2	0·2	0·4	0·3	0·4	0·3	0·3	0·3	0·3	0·2	0·3	0·3	0·4	0·2
Mean difference irrespective of sign							0·1	0·1	0·1	0·1	0·1	0·1	0·1	0·1	0·1	0·1	0·1	0·1	0·1	0·1
Residual difference (— Meteorological Office)							−0·1	0·0	0·0	+0·1	+0·1	0·0	+0·1	−0·1	−0·1	−0·1	0·0	0·0	+0·1	−0·1
Mean monthly difference between simultaneous thermograph and thermometer readings							0·1	0·2	0·2	0·1	0·1	0·1	0·2	0·1	0·1	0·1	0·1	0·2	0·1	0·1
No. of errors in maxima and minima							0	—	3	—	2	—	2	—	5	—	5	—	2	—

* Lost owing to snow, but daily values complete. (ABERDEEN—except for the 27th, when amount by spare gauge is available). † Oil in bearings frozen. ‡ Chimney smoked.
§ Intense frost interfering with gas. ‖ Lamp glass broken. ¶ Changing curve too near the hour. ** Photographic imperfections.

STONYHURST :—The standard dry bulb broken on the 7th, and no check readings supplied throughout the remainder of the month.

Mr. Scott was instructed to inform Dr. Dreyer that the photographic self-recording instruments at Armagh should be returned (P.C. 2425).

Mr. Scott reported that on the 10th of May he had, by instruction of the Council, written to Professor Grant (P.C. 1041), requesting an early settlement of the question of the future maintenance of a self-recording observatory at Glasgow, and had received no reply.

Resolved—That Professor Grant be asked whether there is any chance of the instruments being kept in use by local efforts, as, if not, the Council would wish them to be returned (P.C. 2445).

Submitted—The following reports on the forecasts for July, August, September, and October 1884:—

The letters used have the following signification:—

a complete success. | **c** partial failure.
b partial (*i.e.*, more than half) success. | **d** total failure.

JULY.

3.30 P.M.

Districts.		Percentages. Wind.	Weather.	Average Forecast.	Percentage of Success a + b.
Scotland, N.	a	56	59	58	87
"	b	33	26	29	
"	c	7	8	8	
"	d	4	7	5	
Scotland, E.	a	52	52	52	88
"	b	41	30	36	
"	c	7	7	7	
"	d	0	11	5	
England, N.E.	a	37	48	43	83
"	b	48	33	40	
"	c	11	11	11	
"	d	4	8	6	
England, E.	a	56	63	60	91
"	b	37	26	31	
"	c	0	7	4	
"	d	7	4	5	
Midland Cos.	a	67	52	60	91
"	b	22	41	31	
"	c	7	4	6	
"	d	4	3	3	
England, S.	a	59	52	56	93
"	b	33	41	37	
"	c	8	7	7	
"	d	0	0	0	
Scotland, W.	a	48	59	54	76
"	b	26	19	22	
"	c	15	7	11	
"	d	11	15	13	
England, N.W.	a	52	33	43	82
"	b	26	52	39	
"	c	15	4	9	
"	d	7	11	9	
England, S.W.	a	44	63	54	76
"	b	26	19	22	
"	c	30	7	19	
"	d	0	11	5	
Ireland, N.	a	37	58	48	86
"	b	45	31	38	
"	c	11	4	7	
"	d	7	7	7	
Ireland, S.	a	22	54	38	84
"	b	56	35	46	
"	c	15	11	13	
"	d	7	0	3	

8.30 P.M.

Districts.		Percentages. Wind.	Weather.	Average Forecast.	Percentage of Success a + b.
Scotland, N.	a	65	58	62	91
"	b	29	29	29	
"	c	3	7	5	
"	d	3	6	4	
Scotland, E.	a	55	55	55	93
"	b	36	39	38	
"	c	6	3	4	
"	d	3	3	3	
England, N.E.	a	52	52	52	83
"	b	29	32	31	
"	c	10	10	10	
"	d	9	6	7	
England, E.	a	71	52	62	86
"	b	20	29	24	
"	c	3	16	10	
"	d	6	3	4	
Midland Cos.	a	74	58	66	87
"	b	13	29	21	
"	c	13	7	10	
"	d	0	6	3	
England, S.	a	61	58	60	92
"	b	29	36	32	
"	c	10	6	8	
"	d	0	0	0	
Scotland, W.	a	45	61	53	86
"	b	39	26	33	
"	c	10	10	10	
"	d	6	3	4	
England, N.W.	a	55	49	52	84
"	b	32	32	32	
"	c	10	16	13	
"	d	3	3	3	
England, S.W.	a	52	55	54	86
"	b	32	32	32	
"	c	13	7	10	
"	d	3	6	4	
Ireland, N.	a	42	61	52	81
"	b	32	26	29	
"	c	16	3	9	
"	d	10	10	10	
Ireland, S.	a	32	49	41	84
"	b	42	45	43	
"	c	16	3	10	
"	d	10	3	6	

SUMMARY.

British Isles	a	48	54	51	85
"	b	36	32	34	
"	c	11	7	9	
"	d	5	7	6	
British Isles	a	55	55	55	86
"	b	30	32	31	
"	c	10	8	9	
"	d	5	5	5	

The letters used have the following signification:—

a complete success.
b partial (*i.e.*, more than half) success.
c partial failure.
d total failure.

AUGUST.

3.30 P.M.

Districts.		Percentages. Wind.	Weather.	Average Forecast.	Percentage of Success a + b.
Scotland, N.	a	64	64	64	90
"	b	36	16	26	
"	c	0	16	8	
"	d	0	4	2	
Scotland, E.	a	64	60	62	94
"	b	36	28	32	
"	c	0	8	4	
"	d	0	4	2	
England, N.E.	a	65	62	64	93
"	b	31	27	29	
"	c	4	4	4	
"	d	0	7	3	
England, E.	a	62	54	58	87
"	b	31	27	29	
"	c	7	12	10	
"	d	0	7	3	
Midland Cos.	a	73	54	64	87
"	b	27	19	23	
"	c	0	15	7	
"	d	0	12	6	
England, S.	a	61	54	58	89
"	b	35	27	31	
"	c	4	12	8	
"	d	0	7	3	
Scotland, W.	a	31	62	47	85
"	b	54	23	38	
"	c	8	4	6	
"	d	7	11	9	
England, N.W.	a	54	38	46	81
"	b	38	31	35	
"	c	8	23	15	
"	d	0	8	4	
England, S.W.	a	58	31	45	83
"	b	31	46	38	
"	c	7	15	11	
"	d	4	8	6	
Ireland, N.	a	50	50	50	81
"	b	35	27	31	
"	c	8	8	8	
"	d	7	15	11	
Ireland, S.	a	42	42	42	79
"	b	42	31	37	
"	c	12	19	15	
"	d	4	8	6	

8.30 P.M.

Districts.		Percentages. Wind.	Weather.	Average Forecast.	Percentage of Success a + b.
Scotland, N.	a	68	42	55	83
"	b	29	26	28	
"	c	0	26	13	
"	d	3	6	4	
Scotland, E.	a	61	55	58	87
"	b	32	26	29	
"	c	7	13	10	
"	d	0	6	3	
England, N.E.	a	65	49	57	90
"	b	26	39	33	
"	c	9	6	7	
"	d	0	6	3	
England, E.	a	57	49	53	87
"	b	33	35	34	
"	c	7	13	10	
"	d	3	3	3	
Midland Cos.	a	73	52	63	89
"	b	24	29	26	
"	c	3	16	10	
"	d	0	3	1	
England, S.	a	63	58	61	90
"	b	30	29	29	
"	c	7	10	9	
"	d	0	3	1	
Scotland, W.	a	42	42	42	81
"	b	49	29	39	
"	c	3	10	7	
"	d	6	19	12	
England, N.W.	a	58	45	52	79
"	b	32	23	27	
"	c	10	19	15	
"	d	0	13	6	
England, S.W.	a	43	30	37	72
"	b	37	33	35	
"	c	13	20	16	
"	d	7	17	12	
Ireland, N.	a	43	37	40	75
"	b	37	33	35	
"	c	13	13	13	
"	d	7	17	12	
Ireland, S.	a	33	27	30	72
"	b	44	40	42	
"	c	20	17	19	
"	d	3	16	9	

SUMMARY.

British Isles	a	57	52	55	87
"	b	36	28	32	
"	c	5	12	8	
"	d	2	8	5	
British Isles	a	55	44	50	82
"	b	34	31	32	
"	c	8	15	12	
"	d	3	10	6	

The letters used have the following signification :—

a complete success.
b partial (*i.e.*, more than half) success.
c partial failure.
d total failure.

SEPTEMBER.

3.30 P.M.

Districts.		Percentages. Wind.	Weather.	Average Forecast.	Percentage of Success a + b.
Scotland, N.	a	54	65	60	81
,,	b	19	23	21	
,,	c	19	4	11	
,,	d	8	8	8	
Scotland, E.	a	35	69	52	87
,,	b	46	23	35	
,,	c	15	4	9	
,,	d	4	4	4	
England, N.E.	a	42	69	56	81
,,	b	31	19	25	
,,	c	15	4	9	
,,	d	12	8	10	
England, E.	a	54	50	52	77
,,	b	27	23	25	
,,	c	12	15	14	
,,	d	7	12	9	
Midland Cos.	a	42	58	50	73
,,	b	38	8	23	
,,	c	8	19	14	
,,	d	12	15	13	
England, S.	a	66	69	68	79
,,	b	19	4	11	
,,	c	0	23	12	
,,	d	15	4	9	
Scotland, W.	a	23	46	35	66
,,	b	35	27	31	
,,	c	35	8	21	
,,	d	7	19	13	
England, N.W.	a	31	42	37	72
,,	b	35	35	35	
,,	c	27	12	19	
,,	d	7	11	9	
England, S.W.	a	42	46	44	71
,,	b	27	27	27	
,,	c	19	4	12	
,,	d	12	23	17	
Ireland, N.	a	27	54	41	75
,,	b	46	23	34	
,,	c	19	15	17	
,,	d	8	8	8	
Ireland, S.	a	27	54	41	73
,,	b	46	19	32	
,,	c	23	8	16	
,,	d	4	19	11	

8.30 P.M.

Districts.		Percentages. Wind.	Weather.	Average Forecast.	Percentage of Success a + b.
Scotland, N.	a	45	57	51	80
,,	b	35	23	29	
,,	c	10	13	12	
,,	d	10	7	8	
Scotland, E.	a	47	60	54	79
,,	b	33	17	25	
,,	c	17	17	17	
,,	d	3	6	4	
England, N.E.	a	43	63	53	83
,,	b	33	27	30	
,,	c	17	10	14	
,,	d	7	0	3	
England, E.	a	57	57	57	89
,,	b	37	27	32	
,,	c	6	6	6	
,,	d	0	10	5	
Midland Cos.	a	30	57	44	79
,,	b	53	17	35	
,,	c	10	16	13	
,,	d	7	10	8	
England, S.	a	54	70	62	84
,,	b	33	10	22	
,,	c	13	17	15	
,,	d	0	3	1	
Scotland, W.	a	27	54	41	65
,,	b	26	23	24	
,,	c	37	10	24	
,,	d	10	13	11	
England, N.W.	a	40	47	44	70
,,	b	23	30	26	
,,	c	27	20	24	
,,	d	10	3	6	
England, S.W.	a	42	60	51	75
,,	b	24	23	24	
,,	c	24	7	15	
,,	d	10	10	10	
Ireland, N.	a	27	57	42	77
,,	b	50	20	35	
,,	c	17	20	19	
,,	d	6	3	4	
Ireland, S.	a	38	63	51	73
,,	b	27	17	22	
,,	c	21	10	15	
,,	d	14	10	12	

SUMMARY.

British Isles	a	40	57	49	76
,,	b	34	21	27	
,,	c	17	10	14	
,,	d	9	12	10	

British Isles	a	41	59	50	78
,,	b	34	21	28	
,,	c	18	13	15	
,,	d	7	7	7	

The letters used have the following signification :—

a complete success.
b partial (*i.e.*, more than half) success.
c partial failure.
d total failure.

OCTOBER.

3.30 P.M.

Districts.		Percentages. Wind.	Weather.	Average Forecast.	Percentage of Success a + b.
Scotland, N.	a	26	63	45	88
"	b	56	30	43	
"	c	18	4	11	
"	d	0	3	1	
Scotland, E.	a	33	52	43	83
"	b	48	33	40	
"	c	15	0	8	
"	d	4	15	9	
England, N.E.	a	30	41	36	77
"	b	52	30	41	
"	c	11	18	14	
"	d	7	11	9	
England, E.	a	44	70	57	83
"	b	37	15	26	
"	c	15	8	12	
"	d	4	7	5	
Midland Cos.	a	48	59	54	91
"	b	37	37	37	
"	c	11	4	7	
"	d	4	0	2	
England, S.	a	59	67	63	87
"	b	26	22	24	
"	c	11	11	11	
"	d	4	0	2	
Scotland, W.	a	30	48	39	72
"	b	33	33	33	
"	c	30	11	21	
"	d	7	8	7	
England, N.W.	a	33	52	43	76
"	b	41	26	33	
"	c	22	19	21	
"	d	4	3	3	
England, S.W.	a	44	59	52	81
"	b	33	26	29	
"	c	15	11	13	
"	d	8	4	6	
Ireland, N.	a	41	63	52	86
"	b	41	26	34	
"	c	3	4	3	
"	d	15	7	11	
Ireland, S.	a	26	44	35	72
"	b	44	30	37	
"	c	15	11	13	
"	d	15	15	15	

8.30 P.M.

Districts.		Percentages. Wind.	Weather.	Average Forecast.	Percentage of Success a + b.
Scotland, N.	a	40	47	44	84
"	b	40	40	40	
"	c	20	7	13	
"	d	0	6	3	
Scotland, E.	a	47	67	57	89
"	b	40	23	32	
"	c	10	3	6	
"	d	3	7	5	
England, N.E.	a	52	48	50	84
"	b	29	39	34	
"	c	6	0	3	
"	d	13	13	13	
England, E.	a	55	61	58	90
"	b	32	32	32	
"	c	3	0	2	
"	d	10	7	8	
Midland Cos.	a	45	65	55	92
"	b	45	29	37	
"	c	3	0	2	
"	d	7	6	6	
England, S.	a	42	61	52	91
"	b	49	29	39	
"	c	3	3	3	
"	d	6	7	6	
Scotland, W.	a	23	44	34	64
"	b	37	23	30	
"	c	23	13	18	
"	d	17	20	18	
England, N.W.	a	49	52	51	80
"	b	29	29	29	
"	c	16	16	16	
"	d	6	3	4	
England, S.W.	a	55	49	52	85
"	b	23	42	33	
"	c	16	6	11	
"	d	6	3	4	
Ireland, N.	a	61	48	55	84
"	b	20	39	29	
"	c	6	7	7	
"	d	13	6	9	
Ireland, S.	a	49	42	46	83
"	b	32	42	37	
"	c	3	6	4	
"	d	16	10	13	

SUMMARY.

British Isles	a	38	56	47	82
"	b	41	28	35	
"	c	15	9	12	
"	d	6	7	6	
British Isles	a	47	53	50	84
"	b	34	33	34	
"	c	10	6	8	
"	d	9	8	8	

Mr. Scott reported that further correspondence had been conducted with the Post Office relative to the proposed exhibition of forecasts at local post offices, and that on the 30th of July he had received a letter (No. 1736), authorising the exhibition of forecasts "in special cases, if thought desirable." No action had as yet been taken to announce this fact, as directed by the Council (Minutes, p. 34).

Mr. Scott drew the attention of the Council to the proposal to supply automatic aneroids to certain telegraphic reporting stations (Minutes, 1882, p. 84).

Mr. Galton reported the steps that had been taken (Minutes, 1883, p. 97), and he was requested to communicate with Messrs. Légé as to an instrument recording by pricking at regular intervals (Letter M.O. 2553).

Read—A letter (No. 1869) from the Chief Signal Office, inquiring if the Meteorological Office reduced its barometer readings to those for Gravity in lat. 45°. Mr. Scott was instructed to reply that this correction was not applied (P.C. 2434).

Submitted—A report by Mr. C. Harding, being an abstract of the results of Mr. Glaisher's balloon ascents (Minutes, p. 21).

Read—Letter 2027 (1883), from the Admiral Superintendent of Naval Reserves, inquiring if the observations of sea temperature were to be continued after the close of the year 1884.

Mr. Scott was instructed to report as to the annual cost of the observations.

Submitted—The following statement of work for the four months ended October 31, 1884:—

MARINE ROOM.

November 11, 1884.

Examined 67 new logs and 6 lighthouse registers.

North Atlantic Weather Charts.

In consequence of the late arrival of observations from land stations, considerable additions and alterations have been made to all charts previously reported as completed or nearly completed.

Generalized winds and weather prepared for August, and in part for September and October.

First drawing of isobars and isotherms for December 1882 completed, and examination advanced.

Air and sea isotherms for January 1883, drawn and partly examined.

The tracings of all data for February 1883 completed.

The charting of sea and land observations for March, April, and May being advanced.

The wind observations at stations over 4,000 feet above sea level added to charts.

Sea forms prepared for plotting as necessary. All forms received have been acknowledged, and an intimation conveyed to captains that the special collection of observations has now ceased. The receipt of marine data for the period under discussion may now be considered as ended.

A clerk engaged for ten days in London and Liverpool docks obtaining observations from ships' logs.

Experimenting with the eidograph, testing it in reducing with ordinary and with lithographic ink. Also in tracing calm circles and wind arrows from engraved glass plates, &c.

The female clerks engaged chiefly on the plotting of observations.

A statement prepared showing the present stage of the North Atlantic Charts for the thirteen months—August 1st, 1882, to August 31st, 1883, and an estimate made of the time necessary for the completion of the work.

General.

Variation chart for 1880 finally revised and passed for press.

On the suggestion of Mr. Galton, a comparison made between the means of previous years, and the sea temperatures recorded during May, June, July, and August 1884, within the limits of latitude 45° to 55° N., and longitude 0° to 35° W. The results are recorded in a note on the "Temperature of the Gulf Stream" given with the Daily Weather Report for September 26.

Indexing data in ocean ten-degree squares

(Signed) CHAS. HARDING.

The Marine Superintendent.

Forwarded for the information of the Council.

November 12, 1884. (Signed) HENRY TOYNBEE.

TELEGRAPHIC (FORECAST AND STORM WARNINGS) BRANCH.

October 31, 1884.

Monthly Weather Reports, 1884.—All published up to *August*. *September*.—Completed, and in printer's hands. *October*.—Fairly up to date.

Checking Daily Forecasts.—11 a.m. and 8.30 p.m. Complete to date. Summaries to end of October submitted herewith.

Quarterly Summaries of Weekly Weather Report (with arrears of accumulated heat, rainfall, and bright sunshine):—

First Quarter.—In revise, awaiting approval by the Chairman.

Second Quarter.—Values nearly all calculated, ready for putting into final form; most of them are already copied into their final forms.

Third Quarter.—Commenced.

Return for House of Lords as to Storms experienced between 1874 *and* 1883, *but for which no Warning was issued*.—Completed and handed in.

Quarterly Weather Report, 1877.—Parts 2 and 3. Preparation of Table C. for each month (April to September), completed.

Office

Hay Harvest Forecasts, 1884.—Issue completed; accuracy now being checked.

International Health Exhibition.—Diagrams showing amount of accumulated heat, rainfall and bright sunshine have been filled up regularly from week to week.

Telegraphic Reporting Stations.—New observers have been appointed at *Belmullet* and *Dungeness* since last report, and both have required careful tuition by letter.

A new station is being organised at *Malin Head*, and observer is now being instructed.

All the Inspection Notes received for 1884 have been carefully examined and reported on, and steps are being taken to rectify some defects which were discovered at certain stations.

Vacation.—The staff in this Branch have taken nearly the whole of their vacation during this interval (July to October), so that for the greater part of the time it has been impossible to attend to anything but routine work.

(Signed) FREDC. GASTER.

PANTAGRAPH ROOM.

November 1, 1884.

Quarterly Weather Report, Part IV., 1876.—Proofs of letterpress and plates revised and completed for press.

Part I., 1877.—First and second proofs of letterpress and plates revised.

Part II., 1877.—Letterpress, tables, and plates, completed and forwarded to printer.

Part III., 1877.—Monthly wind charts drawn.

An outline chart has been engraved on copper for lithographer's use in preparing new chart plates..

A good deal of time has been occupied in preliminary work in connexion with these plates, and Plates Nos. 1 to 3, and about half of No. 4 have been drawn on large scale ready for lithographer.

Sunshine Records.—Six months' sunshine cards (Bunhill Row) have been tabulated for the Royal Meteorological Society. The ordinary work connected with the receipt and dating of the cards has been carried on, and, in addition, about 3½ years' cards from Cullompton have been received and dated, &c.

Harmonic Analyser.—The analysis of the thermograms for 1879 and 1880 has been completed, and the monthly coefficients worked. The curves for 1881 are now being dealt with, and those for Valencia are about half finished.

Miscellaneous.—I was occupied for some days on diagrams at the Health Exhibition. Diagrams have been drawn to illustrate Dr. Russell's papers on fog and rain, as well as one or two others for special purposes.

Mr. Call, C. Bracey, and L. Powers were, until the 31st instant, almost entirely occupied on work for the Computing Room; on that day the work connected with the observatory returns was transferred to this Room, C. Bracey being shifted to the Computing Room in exchange for H. Brown.

The usual summer vacation was taken during the interval covered by this report.

(Signed) R. H. CURTIS.

R. H. Scott, Esq., F.R.S., &c.

EXAMINATION ROOM.

SIR, November 1, 1884.

The following *Curves* and *Tabulations* have been examined:—

December (1882), one *Thermogram*; two *Barograms*; and seven *Anemograms*. January (1883), one *Thermogram*. October (1883) to September (1884), one *Thermogram* and two *Barograms*, October to June and August and September, and two of each for July 1884.

The *Notes of Errors* and Monthly Report thereon for December 1882 have been written out; the zero-line value of the Valencia wet-bulb thermograph has been re-determined; and a special examination of the work of all stations made for the inspector's instructions.

Since the date of my last report (1st July) the staff have been absent on the annual vacation, and sickness has also caused the absence of Mr. Aldridge and myself on 9 and 15 days respectively.

I am, &c.

R. H. Scott, Esq., M.A., F.R.S., (Signed) T. E. ALLEN.
Secretary, Meteorological Council.

MEMORANDUM.

October 29, 1884.

HARMONIC ANALYSER.

The temperature curves (dry-bulb only) have been analysed, and the monthly coefficients worked, for the 10 years, 1871–80, inclusive.

The barograms for the year 1876 have been analysed, and the monthly coefficients worked.

(Signed) R. H. CURTIS.

R. H. Scott, Esq., F.R.S.

P.S.—The analysis of the temperature curves for 1881 is now in progress.

Reported—That the cash accounts for the six months ended the 31st March 1884 were audited by the Chairman and Mr. Stone on the 16th July, and had been sent to the Treasury for the Audit Office. The receipts for the six months, exclusive of a balance of 911*l.* 1*s.* 6*d.* on the 1st October 1883, amounted to 9,491*l.* 16*s.* 10*d.* The payments amounted to 8,955*l.* 0*s.* 9*d.*, leaving a balance of 1,447*l.* 17*s.* 7*d.* in hand and at the Bank on the 1st April 1884.

Submitted—The following statement of accounts for the six months ending 30th September 1884 :—

Income.	£ s. d.	£ s. d.
Balance from year 1883-84		820 10 11
Proportion of Vote for six months		7,650 0 0
Repayment of expenses charged under—		
(1.) Incidental expenses	5 0 10	
(2.) Special researches	3 17 11	
(3.) Observatories and stations	7 16 10	
		16 15 7
Supply of Weather Information :		
D.W. Charts and Forecasts	119 2 4	
6 p.m. Charts	12 10 0	
Information for Press Agencies, &c.	43 10 0	
Telegrams	122 14 2	
Miscellaneous data	5 2 10	
		302 19 4
Sale of Instruments, &c. :		
Royal Navy account	16 9 0	
Mercantile Marine account	27 11 8	
		44 0 8
Commission charged on work done for Colonies, &c.		16 7 5
		£8,850 13 11

Expenditure.	£ s. d.	£ s. d.
Administration :		
Payment of Council	500 0 0	
Secretary	400 0 0	
Salaries and wages	379 8 0	
Rent, fuel, and lighting	345 17 5	
Furniture and fittings	3 12 10	
Incidental and contingent expenses	211 8 8	
Pensions	21 8 2	
		1,861 15 1
Special Researches		535 4 11
Land Meteorology :		
Observatories and stations	870 10 6	
Discussion and reduction of observations	659 14 1	
		1,530 11 7
Weather Information and Forecasts :		
Telegraphic reports and storm warnings	1,404 0 6	
Preparation and issue of reports and forecasts	759 16 11	
		2,163 17 5
Inspections :		
Salaries and travelling expenses		280 14 10
Ocean Meteorology :		
Discussion and reduction of observations	898 5 6	
Expenses incidental to the supply of instruments :		
Proportion for care and issue of instruments	100 0 0	
Royal Navy	101 12 3	
Mercantile Marine	176 6 10	
Distant island and coast stations	9 19 4	
		1,286 3 11
Balance		1,192 6 2
		£8,850 13 11

Liabilities.	£ s. d.	Assets.	£ s. d.
To sundry creditors	1,257 14 9	By cash at Bank	995 11 5
„ balance	1,192 6 2	„ „ at Office	77 11 6
		„ „ at Valencia	50 0 0
		„ H. M. Exchequer	1,150 0 0
		„ sundry debtors	176 18 0
	£2,450 0 11		£2,450 0 11

Reported—That the following cheques had been drawn:—

1884.			£	s.	d.	£	s.	d.
July	5th.	For weekly salaries - - -	-		-	28	14	11
„	8th.	W. Allingham, copying observations for Hamburg and Washington	4	4	3			
„	„	„ „ „ „	0	10	0			
„	„	„ „ „ „	1	6	1			
						6	0	4
„	„	Royal Meteorological Society, inspections	-		-	25	0	0
„	„	Autotype Co., cloud pictures - -	-		-	1	17	0
„	„	F. Dangerfield, delivery of Daily Weather Charts			-	11	15	0
„	„	R. Riviere, labels for captains - -	-		-	2	8	0
„	„	Williams and Norgate, books - -	-		-	4	15	6
„	„	R. H. Curtis, diagrams for Health Exhibition			-	21	18	0
„	12th	For weekly salaries - - -	-		-	28	14	11
„	19th	„ „ - - -	-		-	28	14	11
„	24th	Fairholme & Co., cyclostyle - -	-		-	1	11	6
„	„	Wightman & Co., printing - -	2	0	0			
„	„	„ „ B. P. wrappers, &c.	7	16	0			
						9	16	0
„	„	Gas Light and Coke Co., gas - -	-		-	3	14	0
„	„	Stationery Office, extra charges on sea temperature charts - - - - -	-		-	145	5	10
„	„	W. G. James, copying observations for Hamburg			-	8	2	11
„	„	C. E. Strachan, Arctic work - -	-		-	4	3	3
„	„	Johnson, Matthey, & Co., chemicals -	-		-	5	5	0
„	„	Negretti & Zambra, S. R. aneroid -	28	0	0			
„	„	„ „ "A" instruments -	30	4	0			
„	„	„ „ "B T" „ -	63	0	6			
„	„	„ „ instruments bought on commission -	82	4	8			
						203	9	2
„	„	J. J. Hicks, Stevenson's screens -	-		-	5	5	0
„	„	Postmaster-General, telegrams -	-		-	146	1	9
„	„	D. W. Barker, inspections - -	-		-	20	0	0
„	„	H. Mohn, copying synchronous observations	-		-	5	0	0
„	26th	For weekly salaries - - -	-		-	28	14	11
„	31st	R. H. Scott, salary - - -	-		-	66	13	4
„	„	J. S. Harding, jun., salary - -	-		-	27	15	6
„	„	T. D. Bell, salary - - -	-		-	14	8	10
„	„	J. E. Cullum (Valencia), salary -	-		-	16	13	4
„	„	R. H. Curtis -	22	4	5			
„	„	J. A. Curtis -	16	13	4			
„	„	T. E. Allen -	15	11	1			
„	„	C. H. Thompson -	11	13	4			
„	„	S. Call -	10	6	8			
„	„	E. G. Aldridge -	7	6	8			
		Reduction, &c. of observations.				84	15	6
„	„	F. Gaster -	30	4	0			
„	„	F. J. Brodie -	21	0	5			
„	„	G. G. Francis -	19	13	0			
„	„	A. J. Rigby -	16	5	0			
„	„	R. Sargeant -	13	5	9			
		Preparation, &c. of Weather Reports.				100	8	2
„	„	Capt. H. Toynbee	33	6	8			
„	„	Lt. C. W. Baillie -	20	16	8			
„	„	R. Strachan -	27	15	6			
„	„	C. Harding -	22	4	5			
„	„	H. Harries -	14	3	4			
„	„	W. Allingham -	14	3	4			
„	„	W. G. James -	10	8	8			
		Discussion, &c. of observations and care of instruments.				142	18	7
		Carried forward - -				£1,200	1	2

			£	s.	d.	£	s.	d.
1884.		Brought forward -	-		-	1,200	1	2
July 31st		W. Allingham, copying observations for Hamburg and Washington	5	2	8			
,,	,,	,, ,, ,,	0	14	7			
,,	,,	,, collection of synchronous observations - -	1	0	5			
						6	17	8
,,	,,	R. & J. Beck, anemometer for Valencia	-		-	68	7	6
,,	,,	A. J. Rigby, tabulations for Aberdeen	-		-	2	9	6
,,	,,	R. H. Scott, inspections - -	-		-	20	0	0
,,	,,	F. J. Brodie, visiting Dover and Dungeness	-		-	3	1	0
,,	,,	J. S. Harding, junr., petty cash -	-		-	60	0	0
						£1,360	16	10
Aug.	2nd	For weekly salaries - - -	-		-	54	18	5
,,	9th	,, ,, - - -	-		-	30	4	0
,,	16th	,, ,, - - -	-		-	30	4	0
,,	,,	Spongy Iron Filter Co., filter - -	-		-	3	12	10
,,	,,	E. Higgs, office repairs - -	-		-	13	9	6
,,	,,	Postmaster-General, telegrams -	-		-	184	13	10
,,	,,	R. H. Curtis, etching arrows on glass plates	-		-	2	7	0
,,	18th	D. W. Barker, inspections - -	-		-	15	0	0
,,	20th	A. J. Rigby, tabulations for Aberdeen	-		-	3	15	0
,,	23rd	For weekly salaries - - -	-		-	30	0	8
,,	30th	J. H. Woodstock, packing cases -	-		-	2	15	0
,,	,,	R. H. Scott, salary - - -	-		-	66	13	4
,,	,,	J. S. Harding, junr., salary - -	27	15	6			
,,	,,	T. D. Bell, salary - - -	14	8	10			
						42	4	4
,,	,,	J. E. Cullum, salary - - -	-		-	16	13	4
,,	,,	R. H. Curtis -	Reduction, &c. of observations.			22	4	5
,,	,,	J. A. Curtis -				16	13	4
,,	,,	T. E. Allen -				15	11	1
,,	,,	C. H. Thompson -				11	13	4
,,	,,	S. Call - -				10	16	8
,,	,,	E. G. Aldridge -				9	15	10
						86	14	8
,,	,,	F. Gaster - -	Preparation, &c. of Weather Reports.			30	4	0
,,	,,	F. J. Brodie -				21	15	0
,,	,,	G. G. Francis -				16	5	0
,,	,,	A. J. Rigby -				16	5	0
,,	,,	R. Sargeant -				15	18	11
						100	7	11
,,	,,	Capt. H. Toynbee -	Discussion, &c. of observations and care of instruments.			33	6	8
,,	,,	Lieut. C. W. Baillie				20	16	8
,,	,,	R. Strachan -				27	15	6
,,	,,	C. Harding -				22	4	5
,,	,,	H. Harries -				14	3	4
,,	,,	W. Allingham -				14	3	4
,,	,,	W. G. James -				10	8	8
						142	18	7
,,	,,	F. Dangerfield, diagrams for "Principles Weather Forecasting" - - -	-		-	54	10	0
,,	,,	C. Harding, balloon observations -	-		-	5	0	0
,,	,,	Hopkin and Williams, chemicals -	-		-	1	16	2
,,	,,	Johnson, Matthey, & Co. ,, -	-		-	2	11	2
,,	,,	R. H. Scott, inspections - -	-		-	25	0	0
,,	,,	T. De La Rue & Co., sunshine cards -	-		-	8	16	6
,,	,,	J. J. Hicks, portable anemometers -	-		-	24	18	0
		Carried forward -	-		-	£949	4	3

1884.			£ s. d.	£ s. d.
		Brought forward -	- -	949 4 3
Aug.	30th	J. S. Harding, jun., petty cash -	- -	50 0 0
„	„	For weekly salaries - - -	- -	30 4 0
				£1,029 8 3
Sept.	6th	For weekly salaries - - -	- -	30 4 0
„	5th	W. Allingham, collection of synchronous observations		5 5 1
„	13th	For weekly salaries - - -	- -	30 4 0
„	20th	„ „ - - -	- -	30 4 0
„	27th	„ „ - - -	- -	30 4 0
„	30th	R. H. Scott, salary - - -	- -	66 13 4
„	„	J. S. Harding, jun., salary - -	27 15 6	
„	„	T. D. Bell „ - -	14 8 10	
				42 4 4
„	„	J. E. Cullum - - - -	- -	16 13 4
„	„	R. H. Curtis -	22 4 5	
„	„	J. A. Curtis -	16 13 4	
„	„	T. E. Allen -	15 11 1	
„	„	C. H. Thompson -	11 13 4	
„	„	S. Call - -	10 16 8	
„	„	E. G. Aldridge -	7 16 8	
		Reduction, &c. of observations.		84 15 6
„	„	F. Gaster -	30 12 8	
„	„	F. J. Brodie -	20 11 8	
„	„	G. G. Francis -	21 9 10	
„	„	A. J. Rigby -	16 5 0	
„	„	R. Sargeant -	12 0 1	
		Preparation, &c. of Weather Reports.		100 19 3
„	„	Capt. H. Toynbee -	33 6 8	
„	„	Lieut. C. W. Baillie	20 16 8	
„	„	R. Strachan -	27 15 6	
„	„	C. Harding -	22 4 5	
„	„	H. Harries -	14 3 4	
„	„	W. Allingham -	14 3 4	
„	„	W. G. James -	10 8 8	
		Discussion, &c. of observations and care of instruments.		142 18 7
„	„	C. W. Jacques, rent - - -	- -	158 15 0
„	„	J. S. Harding, sen., pension - -	- -	10 14 1
„	„	W. Thomas, care of Scilly anemometer	1 13 7	
„	„	„ meteorological reports -	4 18 0	
				6 11 7
„	„	H. Williams, care of bridled anemometer	2 10 0	
„	„	„ „ Robinson's „	2 14 3	
„	„	„ Meteorological reports -	1 7 0	
				6 11 3
„	„	C. Niven, Aberdeen Observatory -	58 19 8	
„	„	J. L. E. Dreyer, Armagh „ -	12 10 0	
„	„	W. L. Fox, Falmouth „ -	63 8 0	
„	„	Kew Committee, allowance - -	100 0 0	
„	„	C. Clouston, Orkney - - -	2 10 0	
„	„	G. H. Aird, Seaham - - -	2 13 10	
„	„	S. J. Perry, Stonyhurst - -	14 0 0	
„	„	J. E. Cullum, Valencia - -	48 10 8	
				302 12 2
„	„	G. T. Watson, care of Yarmouth anemometer -	4 19 4	
„	„	„ meteorological reports	4 1 6	
				9 0 10
		Carried forward -	-	£1,074 10 4

1884.		£	s.	d.	£	s.	d.
	Brought forward -	-		-	1,074	10	4
Sept. 30th	R. Gibbons, Belmullet - -	4	7	11			
,, ,,	H. Todd, Cambridge - - -	4	11	0			
,, ,,	H. Mohn, Christiania - - -	5	10	0			
,, ,,	J. Lloyd, Dungeness - - -	3	14	1			
,, ,,	W. Brand, Dunrossness - -	3	18	4			
,, ,,	W. Foster, Hawes Junction - -	1	19	10			
,, ,,	C. Durham, Holyhead - - -	2	11	0			
,, ,,	G. G. Appleton, Hurst Castle - -	3	18	5			
,, ,,	J. Fisher, Jersey - - -	3	19	0			
,, ,,	F. Gaster, London - - -	3	18	0			
,, ,,	W. Berridge, Loughborough - -	3	5	7			
,, ,,	K. Kerr, Mullaghmore - -	5	4	7			
,, ,,	W. D. Penny, Nairn - - -	4	4	6			
,, ,,	W. Wickham, Oxford - - -	3	12	6			
,, ,,	G. Phillips, Parsonstown - -	3	7	6			
,, ,,	J. John, Prawle Point - - -	3	5	0			
,, ,,	S. Blake, St. Ann's Head - -	3	7	2			
,, ,,	J. B. Smith, Spurn Head - -	3	5	6			
,, ,,	D. Macdonald, Stornoway - -	5	11	8			
,, ,,	J. Sinclair, Wick - - -	3	5	0			
,, ,,	A. Guy, York - - - -	3	18	0			
					80	14	7
,, ,,	J. Fowler, Cardiff agent - -	7	11	6			
,, ,,	L. Allen, Dundee ,, - -	1	5	0			
,, ,,	J. Gill, Liverpool ,, - -	22	10	11			
,, ,,	C. H. Permain, Southampton agent -	1	11	6			
,, ,,	J. R. Jones, Aberdeen ,, -	2	17	2			
,, ,,	Z. Scaping, Hull ,, -	1	7	6			
					37	3	7
,, ,,	R. Riviere, labels - - -	-		-	2	0	6
,, ,,	Pickford & Co., carriage of parcels -	-		-	2	17	6
,, ,,	Postmaster General, private wire -	20	15	0			
,, ,,	,, telegrams -	202	13	9			
					223	8	9
,, ,,	P. Adie, "Station" barometers -	20	5	0			
,, ,,	,, repairing "A" barometers -	14	15	6			
,, ,,	,, ,, "B T" ,, -	15	1	3			
,, ,,	,, fittings to eidograph - -	0	7	6			
,, ,,	,, barometers for sale - -	6	15	0			
					57	4	3
,, ,,	W. Allingham, copying observations for Washington and Hamburg	0	9	6			
,,	,, ,, ,,	0	9	9			
,, ,,	,, ,, ,,	1	1	10			
,, ,,	,, collection of synchronous observations -	0	10	0			
					2	11	1
,, ,,	J. S. Harding, junr., petty cash -	-		-	30	0	0
					£1,510	10	7

Reported—That the following cheques had been drawn during the month of October :—

1884.		£	s.	d.	£	s.	d.
Oct. 4th	For weekly salaries - - -	-		-	30	4	0
,, 11th	,, ,, - - -	-		-	30	4	0
,, 18th	,, ,, - - -	-		-	30	4	0
,, 23rd	T. W. Baker, inspections - - -	-		-	14	12	1
,, ,,	A. Buchan ,, - - -	-		-	48	11	9
	Carried forward -	-		-	£153	15	10

			£	s.	d.	£	s.	d.
1884.		Brought forward -	-		-	153	15	10
Oct. 23rd	R. H. Scott, inspections - - -		-		-	19	2	1
„ „	G. W. Whipple „ - - -		-		-	30	3	4
„ 25th	For weekly salaries - - -		-		-	30	4	0
„ 31st	R. H. Scott, salary - - -		-		-	66	13	4
„ „	J. S. Harding, junr., salary - -		27	15	6			
„ „	T. D. Bell, salary - - - -		14	8	10			
						42	4	4
„ „	J. E. Cullum, salary - - -		-		-	16	13	4
„ „	R. H. Curtis -	Discussion, &c. of observations.	22	4	5			
„ „	J. A. Curtis -		16	13	4			
„ „	T. E. Allen -		15	11	1			
„ „	C. H. Thompson -		11	13	4			
„ „	S. Call -		10	16	8			
„ „	E. G. Aldridge -		7	16	8			
						84	15	6
„ „	F. Gaster - -	Preparation, &c. of Weather Reports.	30	17	0			
„ „	F. J. Brodie - -		20	11	8			
„ „	G. G. Francis -		20	1	6			
„ „	A. J. Rigby - -		16	5	0			
„ „	R. Sargeant - -		13	0	3			
						100	15	5
„ „	Capt. H. Toynbee -	Discussion, &c. of observations, and care of instruments.	33	6	8			
„ „	Nav.-Lt. C. W. Baillie, R.N.		20	16	8			
„ „	R. Strachan - -		27	15	6			
„ „	C. Harding - -		22	4	5			
„ „	H. Harries - -		14	3	4			
„ „	W. Allingham -		14	3	4			
„ „	W. G. James -		10	8	8			
						142	18	7
„ „	Gas Light and Coke Company, gas -		-		-	2	12	3
„ „	H. Bond and Son, furniture - -		29	0	3			
„ „	J. Weeks & Co., repairing hot-water apparatus		1	2	6			
						30	2	9
„ „	J. H. Woodstock, packing cases - -		-		-	3	1	0
„ „	F. Dangerfield, delivery of D.W. Charts -		-		-	11	16	6
„ „	Kew Committee, verifications, station barometers		2	2	0			
„ „	„ „ „	"A" instruments	3	0	0			
„ „	„ „ „	"B T" „	5	0	0			
„ „	„ „ „	instruments bought on commission -	2	4	0			
						12	6	0
„ „	Postmaster General, telegrams - -		-		-	129	10	10
„ „	J. Green, care of Bermuda anemometer -		-		-	9	3	0
„ „	Royal Meteorological Society, observations		-		-	16	13	4
„ „	J. S. Harding, jun., petty cash - -		-		-	50	0	0
						£952	11	5

116, *Victoria Street, November* 26, 1884.

PRESENT:
LIEUT.-GENERAL STRACHEY IN THE CHAIR.

MR. DE LA RUE.	PROFESSOR STOKES.
MR. GALTON.	MR. STONE.

THE HYDROGRAPHER.

The Secretary was in attendance.

The Minutes of the last meeting (November 12) were read and confirmed.

The consideration of the correspondence with the Directors of the Ben Nevis Observatory was resumed, and the Secretary was instructed to forward the following resolution to Mr. Buchan (P. C. 2,576):—

> Resolved—That the Directors of the Ben Nevis Observatory be informed that the Council will be prepared to continue the grant of 100*l.* yearly, on the general basis arranged last year, but that, with reference to the telegrams to be sent to the Meteorological Office when considerable changes of conditions occur at the Observatory, the Council will undertake not to publish the actual observations, or to refer to them in their forecasts in a form which would be prejudicial to the interests of the Press Association, if last year's arrangement with that body be continued; and the Council request that they may be informed what are the wishes of the Press Association in this respect.
>
> The Council regret that it is not in their power to increase the grant beyond the sum of 100*l.* already named.

The Chairman submitted the following report (Minutes, p. 45):—

In pursuance of the conclusion adopted by the Council that I should, during my visit to America, enter into communication with the proper authorities on the subject of the despatch of telegrams to give intimation of the occurrence of cyclonic gales on the Atlantic, I called on the Hydrographer of the United States Navy at Washington, and ascertained from him that he had discussed the matter with General Hazen, the Head of the Signal Office, and that they had come to the conclusion that the needful arrangements would be better carried out under the control of the Signal Office than of his own Department. He also informed me that General Hazen had consented to undertake the duty. I further called on the Secretary for War, and he expressed the opinion that the Signal Office might properly undertake what was proposed, subject to the condition that no extra expense should be thrown on that Department, and that all necessary charges should be met by us. This I explained was our intention.

I accordingly communicated to the Signal Office a copy of the minute of the resolution come to at the meeting of the Council on the 5th September, which explained the view adopted by the Meteorological Office as to the best method of proceeding.

In reply to this I received the letter from Captain Mills, dated the 18th October, to which I replied in my letter of the 22nd October, which letters are annexed.

I further ascertained, with reference to the doubt I had expressed as to the cost of telegrams in code cipher, that the charges would not be in excess of those that had been contemplated, and it was arranged that the code should be prepared as proposed, and a copy sent to London for use in the Meteorological Office.

It will, I think, be desirable to take steps for preparing a note explaining the manner in which it seems desirable that the weather report of the captains of the Atlantic steamers should be prepared for delivery to the Officer of the Signal Office on arriving at New York or Boston, and that copies of this note should be furnished to the captains, and their co-operation invited through the owners of the great steamship companies.

(M.O. 2570.)

Signal Office, War Department,
Washington City, October 18, 1884.

SIR,

ACKNOWLEDGING the receipt of your communication of September 5th, I beg to inform you that this Office will be pleased to co-operate in the plan of sending storm warnings of the Meteorological Office at London, as suggested in your communication of the above-mentioned date.

With the general plan, as proposed by you to guide me, I have prepared a cipher which I submit for your consideration. If approved, I will have copies of this cipher printed, and furnished to your Office, and to my agents in Boston and New York, who will be charged with the collection of information and preparation of despatches. I find, upon investigation, that such a cipher *can be used* at regular rates, and that it will save you considerable expense.

I would suggest in this connexion, that you might be able to assist this Office by communicating the object and general plan of the work to the officials of the steamship lines from London and Liverpool to Boston and New York, as most of them are under direction of English officials.

Please return the cipher with your approval or remarks thereon, when immediate steps will be taken to put this very excellent plan into execution. The only expense which this bureau can assume will be for the services of two agents, who will be stationed in New York and Boston.

I am, &c.
(Signed) F. W. MILLS,
Captain 5th Artillery,
Acting Chief Signal Officer, U.S.A.

Lieut.-General R. Strachey,
Chairman, Meteorological Committee.

(M.O. 2570.)

Washington, October 22, 1884.

SIR,

I HAVE to acknowledge the receipt of your letter of the 18th instant in reply to the communication made to you by the Meteorological Council of Great Britain, relative to the transmission of telegrams to London containing reports of the weather over the Western Atlantic, for the information of the Meteorological Offices at Paris and London, and in behalf of the Council, I desire to convey my sincere thanks for the very obliging manner in which our request has been received and acted upon by the Signal Office.

I have carefully considered the proposals contained in your letter under reply, and have examined the cipher code which you have been so good as to prepare for the object in view, and I am happy to say that the suggested arrangements appear quite suitable for the purpose in view, though the code goes beyond what is strictly necessary, at all events for the outset.

The only question that arises is as to the cost of the telegrams, on which your letter is not quite explicit. If the expense for a daily message does not exceed the sum estimated in the memorandum I left at the Signal Office, I see no reason why immediate steps may not be taken for printing the code, and commencing the despatch of messages as soon as the printed copies of the code have been received in England.

It is of course understood that the Signal Office will only contribute the services of its agents at Boston and New York, and that all direct charges will be met by the Meteorological Office of London.

I am, &c.
(Signed) R. STRACHEY,
Chairman of the Meteorological
Council of Great Britain.

To the Chief Signal Officer, U.S.A.,
Washington.

P.S.—The draft code is returned herewith.—R. S.

Read—Letter 2624 from the Secretary of the Royal Cornwall Polytechnic Society, inquiring if the Office would supply a cast-iron column for the support of the anemograph at the new observatory at Falmouth (Minutes, 1883, p. 76).

Mr. Scott stated that he had ascertained that the cost of the column would be about 20*l*. He was instructed to inform the Society that the cost of such a column would be allowed, and to request that a statement of the estimated cost of erection of the instruments be supplied (P.C. 2531).

Mr. Scott reported that the cost of the sea-surface temperature observations (Minutes, p. 64) was 9*l*. 15*s*. annually, exclusive of postage and the carriage of instruments. The number of thermometers supplied since April 1879 was 260, and the annual loss by breakage, &c., was 30.

He was instructed to request the Admiral Superintendent to continue the observations.

Read—Letter 2548 from Miss Clouston, stating that her father, the Rev. C. Clouston, LL.D., died on the 10th instant.

Mr. Scott was instructed to convey to Miss Clouston the expression of the sincere regret of the Council at the death of Dr. Clouston.

He was also instructed to consult Mr. Buchan as to the future maintenance of an anemograph in the Orkneys or Shetlands, in case Dr. Clouston's successor was not willing to maintain the instrument at Sandwick Manse.

Submitted—The following memoranda :—

MATERIALS for preparing ESTIMATES for the year 1885–86.

	Data for framing Estimates.	Estimated Expenditure for 1885–86.	Proposed for Estimates for 1885–86.	Proposed for last year.
Administration :	£	£	£	£
(1.) Council	- -	1,000	1,000	1,000
(2.) Secretary	- -	800	800	800
(3.) Salaries and Wages (calculated from actual rates of payment in October 1884) :—	- -	758	770	747
Chief Clerk	*333			
1 Junior Clerk	*173			
2 Boys	* 78			
Office Keeper	*109			
Messenger	* 65			
	758			
(4.) Rent, fuel, and lighting	- -	705	700	700
Payments for one year ending 30th September 1884 :—				
Rent	635			
Coals, wood, &c.	48			
Gas	22			
	705			
(5.) Incidental and contingent expenses	- -	440	450	450
Payments for one year ending 30th September 1884 :—				
Office Keeper's contingent account, including porter's allowance for cleaning, &c.	190			
Postage	73			
Furniture and Office repairs	94			
Carriage of parcels, &c.	43			
Stationery Office : Annual Reports and sale of forms	43			
Copying synchronous observations	11			
Sundries : attendance in court, assurance, &c.	41			
	495			
Deduct repayments under this head, and including "Commission"	55			
	440			
(6.) Pensions (Mr. J. S. Harding, senr.)	- -	43	40	43
Special Researches and Experiments	- -	1,000	1,000	1,000
(1.) Salaries (calculated from actual rates of payment in October 1884) :—				
Harmonic analysis (Mr. Sheerman)	*117			
Atlantic synchronous work (female staff and one "writer")	*338			
(2.) Other payments for one year ending 30th September 1884 :—				
Copying observations for M. Neumayer	17			
Arctic work (Strachan)	21			
Bridled anemometer (Holyhead)	10			
Scilly anemometer	7			
Clouds	15			
Actinometer observations (Kew)	8			
Barometer Manual (Richards)	11			
Harmonic instrument (Légé)	28			
Anemometer for electrical experiments	10			
Hygrometer experiments (Shaw)	50			
Health Exhibition diagrams (Curtis)	22			
Sea temperature charts (Stationery Office)	145			
Carried forward	- -	4,746	4,760	4,740

* For eight hours' work daily.

	Data for framing Estimates.	Estimated Expenditure for 1885–86.	Proposed for Estimates for 1885–86.	Proposed for last year.
	£	£	£	£
Brought forward - - -	- -	4,746	4,760	4,740
(2.) Other payments for one year ending 30th September 1884—*continued.*				
Weather types (Dangerfield) - - -	55			
Balloon observations (C. Harding) - -	5			
Ben Nevis Observatory - - - -	100			
Sunshine cards - - - - -	18			
	977			
Deduct repayments under this head - -	32			
	945			
The amount under this head is, as usual, put at 1,000*l.*, without regard to expenditure. Any expense for the experiment of telegrams from the United States will probably be included under this head at first.				
Land Meteorology:				
(1.) Observations and stations - - - -	- -	1,700	1,750	2,000
Regular allowances to observatories:—				
Aberdeen - - - - - -	275			
Armagh - - - - - -	50			
Falmouth - - - - - -	250			
Kew - - - - - -	400			
Stonyhurst - - - - -	56			
Valencia (including rent and expenses for 12 months ending 30th September 1884) - -	456			
Other payments for one year ending 30th September 1884:—				
Four anemograph stations (including postages) -	50			
Copies of observations (Royal and Scottish Meteorological Societies) - - -	122			
Instruments - - - - -	101			
Sundries: chemicals, waxed papers, postages, &c. - - - - - -	37			
	1,797			
Deduct charges for instruments which will probably not recur at present - - - -	101			
	1,696			
A payment of 75*l.* to Mr. Call is omitted from above statement, being a special case, and non-recurring. The amount proposed for last year (2,000*l.*), included (1) 100*l.* for Ben Nevis Observatory, whereas the amount this year is allowed for under Special Researches; and (2), 100*l.* for possible establishment of anemograph or Second Order stations. Any extra expense owing to the new observatory at Falmouth will probably fall under the year 1883–4. There may be some expense in connexion with Glasgow Observatory.				
(2.) Discussion and reduction of observations (calculated from actual rates of payment in October 1884) -	- -	1,280	1,300	1,250
1 Senior Clerk - - - - -	*267			
4 Junior Clerks - - - -	*657			
3 Temporary Clerks - - - -	*258			
3 Boys - - - - - -	* 98			
	1 280			
This list includes the late Pantagraph Branch, now engaged on the Quarterly Weather Report, and the Computation and Examination Branches.				
Carried forward - - -	- -	7,726	7,810	7,990

* For eight hours' work daily.

	Data for framing Estimates.	Estimated Expenditure for 1885–86.	Proposed for Estimates for 1885–86.	Proposed for last year.
	£	£	£	£
Brought forward - - -	- -	7,726	7,810	7,990
Weather Information and Forecasts - - - -	- -	2,700	2,750	2,720
(1.) Telegraphic reports and storm warnings: Payments for one year ending 30th September 1884:—				
Reports to Meteorological Office - -	989			
„ Reports sent abroad - -	522			
Storm warnings - - - -	484			
Hay harvest forecasts - - - -	50			
Private wires - - - - -	91			
Payments to reporters, &c. - - -	621			
Reports to Jersey - - - -	32			
Sundry telegrams, forecasts, &c. - -	30			
Postage of charts and incidental expenses -	221			
Instruments, screens, &c. - - -	47			
Delivery of charts by hand - - -	47			
Wrappers, printing, &c. - - -	22			
Storm signal shapes - - - -	7			
Weekly Weather Reports - - -	8			
Hoffmeyer's charts - - - -	37			
	3,208			
Add charges for new stations Belmullet, Malin, and Dungeness - - - - - -	100			
	3,308			
Repayments during the same period - - -	605			
	2,703			
Possibly some saving under this head could be made (1) by using the A B C Telegraphic Code for messages to Jersey; and (2) by grouping and copying messages for transmission abroad in this Office instead of at the Post Office. At present we pay the Post Office nearly 100*l.* a year for this service, and we cannot always be sure that nothing unnecessary is sent. It has yet to be seen whether such a change could be made without detriment to the work. The additional annual cost of a duplexed Morse printer, for receiving and transmitting reports simultaneously, would be 10*l.* a year. It is proposed above that any extra expense for American telegrams should at first be charged under Special Researches.				
(2.) Preparation and issue of reports and forecasts (calculated from actual rates of payment in October 1884) - - - - -	- -	1,524	1,530	1,490
1 Senior Clerk (9 hours daily) - - -	300			
4 Junior Clerks „ - - -	725			
1 Temporary Clerk „ - - -	109			
1 Telegraphist - - - - -	*98			
2 Boys - - - - - -	*73			
Messenger - - - - -	31			
Addition for late evening and Sunday attendance. The payments for this, for one year ending 30th September 1884, were - - -	188			
	1,524			
Inspections - - - - - - -	- -	550	550	500
Charges for current year (partly unpaid):				
Mr. Baker, expenses - - - - -	15			
Mr. Barker „ - - - - -	35			
Mr. Brodie „ - - - - -	3			
Mr. Buchan „ - - - - -	56			
Royal Meteorological Society, contribution - -	25			
Mr. Scott, expenses - - - - -	79			
Capt. Toynbee „ - - - - -	11			
Mr. Whipple „ - - - - -	30			
	254			
Salaries - - - - - - -	300			
Mr. Ley's expenses (account not yet received) say -	26			
	580			
Expenses under this head have increased of late years. Different persons necessarily go partly over the same ground. This year there are exceptional expenses.				
Carried forward - - -	- -	12,500	12,640	12,700

* For eight hours' work daily.

	Data for framing Estimates.	Estimated Expenditure for 1885–86.	Proposed for Estimates for 1885–86.	Proposed for last year.
	£	£	£	£
Brought forward - - -	- -	12,500	12,640	12,700
Ocean Meteorology - - - - - -	- -	1,810	1,820	1,770
(1.) Discussion and reduction of observations (calculated from actual rates of payment in October 1884) :				
Marine Superintendent - - - - -	400			
Assistant „ - - - - -	250			
1 Senior Clerk (in charge of instruments) -	*333			
1 „ „ („ Marine Rooms) -	*267			
3 Junior Clerks - - - - - -	*465			
4 Temporary Clerks - - - - -	*296			
	2,011			
Deduct proportion chargeable to care and issue of instruments (say) - - - -	200			
	1,811			
(2.) Proportion chargeable to care and issue of instruments - - - - - - -	- -	200	200	200
(3.) Supply of instruments to Royal Navy - -	- -	200	200	200
Payments for one year ending 30th September 1884 :—				
Instruments and repairs - - -	170			
Kew for verifications - - - -	35			
Sundries, freight, &c. - - -	7			
	212			
(4.) Supply of instruments, &c. to the Mercantile Marine	- -	370	420	400
Payments for one year ending 30th September 1884 :—				
Instruments and repairs - - -	206			
Kew for verifications - - - -	29			
Agents fees, &c. - - - -	175			
Presentation labels - - - -	8			
Collection of synchronous observations -	83			
Sundries : packing cases, printing, &c. -	44			
	545			
Deduct receipts for sale of instruments during the same period - - £98				
And the collection of synchronous observations is probably now finished - 83				
	181			
	364			
There is not much comparison between the expense in one year and in another under this head. The average expenditure for 10 years ending March 1879 was 469*l.*				
(5.) Distant island or coast stations - - -	- -	20	20	30
The only payments at present under this head are for care of anemometer at Bermuda - -	18			
Totals - - - £	- -	15,100	15,300	15,300

NOTES.—The saving effected by the reduction of expenses at observatories is 720*l.* This amount is to a considerable extent absorbed by expenses under other heads in the following way :—

The printed Estimates for 1883–84 (two years ago) show that in 1883 the estimated expenditure was 270*l.* in excess of the Vote, the amounts proposed for the Estimates being reduced so as to bring the *total* within the Vote - - - - - - - - - -	£270
A sum of 150*l.* previously charged under Special Researches (for part salaries of Lieut. Baillie and Mr. Gaster) is now charged to its proper heads - - - - - - - -	150
Increments to clerks in 1884 (alone) exceed - - - - - - - -	100
Estimated expenditure this year *less than Vote* - - - - - - - -	200
	£720

If any further saving be effected, it will probably be under "Special Researches." The chief margins allowed in the present "Materials" are under Observatories, Weather Information, and Mercantile Marine, 50*l.* being added in each case.

[J. S. H.]

* For eight hours' work daily.

METEOROLOGICAL OFFICE. ESTIMATES for the Year 1885–86.

Heads of Service.	Proposed for 1885–86.		Proposed for 1884–85.		1885–86. Increase.	1885–86. Decrease.
Administration:	£	£	£	£	£	£
Payment of Council	1,000		1,000			
Secretary	800		800			
Salaries and wages	767		750			
Rent, fuel, and lighting	700		700			
Incidental and contingent expenses	450		450			
Pensions	43		40			
		3,760		3,740	20	
Special Researches and Experiments		1,000		1,000		
Land Meteorology:						
Observatories and stations	1,750		2,000			
Discussion and reduction of observations	1,300		1,250			
		3,050		3,250		200
Weather Information and Forecasts:						
Telegraphic reports and storm warnings	2,750		2,720			
Preparation and issue of reports and forecasts	1,530		1,490			
		4,280		4,210	70	
Inspections:						
Salaries and travelling expenses		550		500	50	
Ocean Meteorology:						
Discussion and reduction of observations	1,820		1,770			
Expenses incidental to the supply of instruments:						
Care and issue of instruments	200		200			
Royal Navy	200		200			
Mercantile Marine	420		400			
Distant islands (and coast) stations	20		30			
		2,660		2,600	60	
Totals £		15,300		15,300	200	200

[R. S.]

The estimates were approved, and the Secretary was instructed to forward a copy to the Treasury (P.C. 2597).

Read—A memorandum from Captain Toynbee reporting that since the last meeting nine logs had been received, six of them being "excellent."

Observer.	Ship.	Period.	Voyage.	Last mention on Minutes.
Commander A. Carpenter. Lieut. A. C. Williamson. — T. H. C. East	H.M.S. "Myrmidon."	June 22—Oct. 31, 1884.	Surveying Red Sea	1883, p. 36.
Capt. R. D. Lunham	Steam yacht "Ceylon."	Jan. 5—Sept. 16, 1884.	Mediterranean, Madeira, Iceland, and home.	1876, p. 135.
Capt. J. F. Maclear, R.N. Lieut. W. V. S. Howard.	H.M.S. "Flying Fish."	Apr. 18—Aug. 14, 1884.	Surveying China Seas	1884, p. 49.
Capt. W. Olver	Barque "Clynder."	Dec. 21, 1883—Sept. 12, 1884.	Sydney, New Zealand, &c.	1881, p. 55.
Capt. A. Simpson (No. 90,667.)	S.S. "Australasian."	July 9—Nov. 9, 1884.	Plymouth, Sydney, viâ the Cape, home by Canal.	—
Capt. R. Strang	"Lyttelton"	Feb. 2—Nov. 16, 1884.	London, New Zealand, and home.	1883, p. 75.

Mr. Scott was instructed to present the Charts (O. 27) to Captain A. Simpson, No. 90,667, and to convey the best thanks of the Council to the other observers.

Read—Letter 2610 from the Orient Steam Navigation Company, stating that they had established a coaling station on the Island of Diego Garcia, and that the officer in charge of it would be ready to take observations if instruments were supplied.

Mr. Scott was authorized to supply the instruments.

Reported—That Miss Alice Whatley had died on the 18th instant.

With reference to the resolution passed at the last meeting (Minutes, p. 47), Professor Stokes reported that a renewed examination of the sky with reference to the rain-band led him now to think it possible that something might be made of it, with suitable directions as to the part of the sky to aim at; but it is obviously desirable that the instrument should, if possible, be made quantitative, and as one simple method had occurred to him which might conceivably effect this object, he was unwilling to order an instrument until he should be able to try this method.

116, *Victoria Street, December* 17, 1884.

PRESENT:

PROFESSOR STOKES IN THE CHAIR.

MR. DE LA RUE.	MR. STONE.
MR. GALTON.	THE HYDROGRAPHER.

The Secretary was in attendance.

The Minutes of the last meeting (November 26) were read and confirmed.

Submitted—The following letter (Minutes, p. 73) :—

(M.O. 2746.) Signal Office, War Department, Washington City, November 26, 1884.

SIR,

REFERRING to the previous correspondence in regard to sending storm warnings to the Meteorological Office in London, I beg to enclose, herewith, for your information, a copy of letter of instructions sent to the observers of the Signal Service, United States Army, at New York City and Boston, Massachusetts.

I am, &c.
(Signed) F. W. MILLS,
Captain, 5th Artillery,
Acting Chief Signal Officer.

Lieut.-General R. Strachey,
Chairman of the Meteorological Council
of Great Britain.

(M.O. 2746.) War Department, Office of the Chief Signal Officer
Washington City, November 22, 1884.

I AM directed by the Chief Signal Officer to inform you that the enclosed cipher is for the purpose of enciphering weather telegrams to be sent by you to the Meteorological Council of Great Britain, the object being to give information to the Council of storms approaching Great Britain from the westward. The plan of obtaining information, enciphering, and telegraphing is as follows, and will be put in operation on December 1st proximo :—

You will obtain information for the cipher telegrams only from the logs of large steamers arriving from Liverpool and London, and for this purpose you will board the steamers immediately upon arrival, explain your errand, and request permission to examine the log; not more than one message will be sent on any one day. Messages will be restricted to occasions on which the wind force rose to seven (7) or upwards by Beaufort's scale, with cyclonic change of direction.

The meridian of forty-five (45°) degrees Longitude, west of Greenwich will be the line, eastward of which the weather need not be reported. Cipher messages will embrace only such data as is provided for in the cipher, special attention being given to the reporting of icebergs. Whenever the log shows a record of icebergs west of the 45th meridian, the message will be sent; although the wind velocity at the time may have been below seven (7) of Beaufort scale. Messages will be filed for transmission at night, *at press rates only*, and will be paid for by the Meteorological Council of Great Britain. Messages will be addressed "Scott, London," and signed "Hazen," as per examples in the cable code. Arrangements have been made in London for the receipt and delivery of the messages, but should any difficulty arise, the local address in London is 116, Victoria Street, and the officers of the Council are Lieut.-General R. Strachey, Chairman, Robert H. Scott, Secretary, and Captain Henry Toynbee, Marine Superintendent.

Very respectfully, &c.
(Signed) B. M. PURSSELL,
2nd Lieutenant, Signal Corps, U.S.A.

A true copy.
Signed) B. M. PURSSELL,
2nd Lieutenant, Signal Corps, U.S.A.

Mr. Scott reported that six telegrams had been received since the 1st instant. He was instructed to arrange with the Chairman as to necessary changes in the system.

SUBMITTED—The following STATEMENT respecting the RECORDS for January 1883, received from the SELF-RECORDING OBSERVATORIES (see Minutes, 21st December 1868 and 20th November 1876).

——	Aberdeen.		Armagh.		Falmouth.		Glasgow.		Kew.		Stonyhurst.		Valencia.	
ANEMOGRAPH :—	Direction.	Velocity.	Direction.	Velocity.	Direction.	Velocity.	Direction.	Velocity.	Direction.	Velocity.	Direction.	Velocity.	Direction.	Velocity.
Action	Good.	Good.	Good	Good	Good.	Good.	Good.	Good.	Good.	Good.	Good	Good.	Good	Good.
Records deficient, due to stoppage of clock	0	0	0	0	0	0	0	0	0	0	0	0	0	0
„ „ other causes	0	0	0	0	0	0	0	0	*1	*2	†2 ‡1	†2 ‡3	0	0
Orientation verified	27th	—	31st	—	16th	—	—	—	4th	—	29th	—	16th	—
No. of errors discovered by subsidiaries	0	0	0	0	0	0	0	0	0	0	0	0	0	0
„ „ irregular differences	0	0	0	3	0	1	0	4	9	0	5	3	2	1
Result of 40 Remeasurements :—														
Greatest difference	0·0	2·0	0·0	1·0	0·0	1·0	1·0	2·0	1·0	1·0	0·0	2·0	0·0	2·0
Mean difference irrespective of sign	0·0	0·6	0·0	0·4	0·0	0·3	0·0	0·4	0·1	0·4	0·0	0·3	0·0	0·5
Residual difference (— Meteorological Office)	0·0	−0·1	0·0	0·0	0·0	0·0	0·0	0·0	−0·1	0·0	0·0	−0·1	0·0	−0·1
RAIN GAUGE :—														
Action	Good.		Good.		Good.		Good.		Good.		Good.		Good.	
Records deficient, due to stoppage of clock	0		25 hrs.		2 hrs.		0		0		0		22 hrs.	
„ „ other causes	0		0		0		0		0		0		0	
Errors in tabulation	0		1		0		1		6		5		1	

BAROGRAPH :—							
Action	Good.	Good.	Good.	Good.	Good.	Good.	Good.
Photography	Do.	Fair.	Fair.	Indifferent.	Do.	Do.	Do.
Records deficient, due to stoppage of clock	0	0	0	0	0	1	0
„ „ failure of light	0	0	0	0	0	0	0
„ „ other causes	0	0	0	§5	0	0	0
No. of errors discovered—							
In entry of standard	0	0	0	1	6	8	0
„ calculating residual correction	0	1	0	4	1	2	2
„ applying residual correction	1	4	1	5	2	1	1
„ subtraction in subsidiary tables	0	0	0	3	1	24	1
„ tabulation by subsidiaries	0	0	0	0	0	0	1
„ „ irregular differences	0	3	1	2	1	28	3
Result of 40 *Remeasurements :—*							
Greatest difference	0·006	0·006	0·008	0·005	0·008	0·004	0·008
Mean difference irrespective of sign	0·002	0·002	0·003	0·002	0·002	0·002	0·003
Residual difference (— Meteorological Office)	0·000	0·000	+0·001	0·000	0·000	0·000	—0·001
Mean monthly difference between simultaneous barograph and barometer readings	0·002	0·002	0·001	0·002	0·002	0·001	0·002

THERMOGRAPH :—																
Action	Good.		Good.		Good.		Good.		Good.		Good.		Good.			
Photography	Do.		Do.		Do.		Indifferent.		Do.		Do.		Do.			
	Dry.	Wet.	Dry.	Wet.	Dry.	Wet.	Dry.	Wet.	Dry.	Wet.	Dry.	Wet.	Dry.	Wet.		
Records deficient, due to stoppage of clock	0	0	0	0	0	0	0	0	0	0	0	0	0	0		
„ „ failure of light	0	0	0	0	0	0	0	0	0	0	0	0	0	1		
„ „ imperfectly moistened bulbs	—	0	—	0	—	27	—	0	—	0	—	0	—	0		
„ „ partially frozen bulbs	—	19	—	10	—	0	—	5	—	6	—	7	—	0		
„ „ other causes	0	0	0	0	0	0	0	0	0	0	¶46	¶46	0	0		
No. of errors discovered in entry of standard	0	0	0	1	2	2	0	1	2	0	4	2	0	0		
„ „ by subsidiary measurements	0	0	0	0	0	0	0	0	0	0	0	0	0	0		
„ „ of subtraction in do. tables	0	0	0	1	3	1	4	5	3	1	3	2	4	0		
„ „ detected under glass scale	0	0	0	0	0	0	0	0	0	0	0	0	1	0		
Result of 40 *Remeasurements :—*																
Greatest difference	0·2	0·2	0·4	0·3	0·4	0·3	0·2	0·4	0·2	0·2	0·2	0·3	0·4	0·2		
Mean difference irrespective of sign	0·1	0·1	0·1	0·1	0·1	0·1	0·1	0·1	0·1	0·1	0·1	0·1	0·1	0·1		
Residual difference (— Meteorological Office)	—0·1	0·0	+0·1	+0·1	+0·1	+0·1	0·0	—0·1	—0·1	—0·1	0·0	+0·1	+0·1	0·0		
Mean monthly difference between simultaneous thermograph and thermometer readings	0·1	0·2	0·1	0·1	0·1	0·1	0·2	0·1	0·1	0·1	0·1	0·1	0·1	0·2		
No. of errors in maxima and minima	0	—	1	—	2	—	3	—	3	—	3	—	0	—		

* Clamping-pin broke. † Repairing instrument. ‡ Cylinder not sufficiently clamped. § Out of focus. ¶ Binding-rod stopped cylinder.

Mr. Scott reported that he had applied for space at the Inventions Exhibition, and he was instructed to arrange provisionally for the instruments to be exhibited and to report to the Council.

Mr. Stone made a verbal report on Mr. Abercromby's "Principles of Forecasting, &c." (Minutes, p. 47), and he was requested to put in writing the changes he proposes, with a view to their being circulated amongst the members of Council.

With reference to the results from the harmonic analyser, for temperature, for the 10 years 1871–80 (Minutes, p. 47), Mr. Scott was instructed to have the curves for Valencia, Aberdeen, and Kew drawn for one year by General Strachey's instrument (Minutes, p. 26), and to submit them to the Council at next meeting.

Submitted—The following Memorandum:—

Meteorological Office, December 17, 1884.

The mean pressure charts for the Atlantic, Pacific and Indian Oceans will, so far as the observations contained in the Office logs are concerned, probably be completed during the present month, but as there are parts of the sea for which no observations exist in this Office, I propose in the first instance to request permission to examine, and extract from, the Admiralty Remark Books and the published records of old exploring voyages. Should the Council approve of this, I would suggest that these observations be plotted on the charts, independently of our own, a distinguishing mark being placed against them. It would finally be a question for the Council to decide whether or not a similar course of action should be followed with regard to recent publications of barometrical means by foreign institutes.

(Signed) C. W. Baillie.

Resolved—That Mr. Baillie's suggestions be carried out as regards the plotting, distinguishing marks being used when the instruments used were other than those which have been verified at the Kew Observatory.

Mr. Scott drew the attention of the Council to the subject of the supply of automatic aneroids to the Telegraphic Reporting Stations (Minutes, p. 63).

Resolved—That four self-recording aneroids (Richard's) be purchased, and that these, with the instrument already in the Office, be supplied to five of the Telegraphic Stations.

Mr. Scott inquired if it was the intention of the Council to undertake—I., any discussion of the anemometrical data accumulated in the Office; or II., any tabulation of the sunshine records.

The Council was of opinion that—I., no discussion should be undertaken at present; and II., that no numerical tabulation of sunshine should be carried out.

Read—A memorandum from Captain Toynbee, reporting that since the last meeting eight logs had been received, six of them being "excellent."

Observer.	Ship.	Period.	Voyage.	Last mention on Minutes.
Capt. J. Buchan -	Barque "Coppename."	July 1—Nov. 30, 1884.	Surinam and home -	1884, p. 20.
Capt. T. W. Freeman	S.S. "Bellerophon."	July 26—Nov. 29, 1884.	China and home -	1884, p. 31.
Capt. H. Longley -	S.S. "Mosser" -	Oct. 6, 1883—Nov. 7, 1884.	China, Japan, New York, and home.	1882, p. 9.
Capt. W. L. Rosseter	Barque "St. Kilda."	Aug. 28—Dec. 8, 1884.	Liverpool, Demerara, and home.	1884, p. 49.
Capt. P. J. Irving -	S.S. "Republic"	June 18—Nov. 28, 1884.	Liverpool and New York (5 voyages).	—
Capt. W. H. Trant -	S.S. "Venetian"	April 17—Dec. 6, 1884.	Liverpool, Boston (6 voyages).	—

Mr. Scott was instructed to present the Charts (O. 32) to Captains Irving and Trant, and to convey the best thanks of the Council to the other observers.

Resolved—That a bonus of 3*l.* 3*s.* be allowed, as in former years, to those of the telegraphic reporters who have observed for the complete year.

Submitted—The following statements of work for November 1884:—

MARINE ROOM.

December 16, 1884.

Examined 12 new logs.

North Atlantic Weather Charts.

Specimen reduced charts for September 1, 1882, prepared by eidograph working in ink.
Generalized winds and weather for September completed.
First examination of air and sea isotherms for December, 1882, completed.
Isobars for January 1883 being drawn, and examination of air and sea isotherms completed.
First drawing of air and sea isotherms for February completed.
Tracings of all data for March advanced.
Copying American isobars and isotherms and European isotherms for various months.
The female clerks wholly engaged plotting observations.
Miss Whatley, who had proved herself a very valuable assistant to the Marine Room, died on November 18.

General.

Hydrographic notice from the Meteorological Log No. 5998 copied for the Admiralty.
Indexing data in ocean 10-degree squares.

The Marine Superintendent. (Signed) CHAS. HARDING.

Forwarded for the information of the Council.

(Signed) HENRY TOYNBEE,
Marine Superintendent.

TELEGRAPHIC (FORECAST AND STORM WARNING) BRANCH.

December 1, 1884.

Monthly Weather Reports.—1884, *September.*—Revised and published. *October.*—Copy prepared and in printer's hands. *November.*—Well up to date.

Checking of Daily Forecasts, 1884 (3.30 p.m. and 8.30 p.m.)—Well up to date. Summary for November herewith.

Checking of Hay Harvest Forecasts, 1884.—About three-fourths done.

Quarterly Summaries of Weekly Weather Report, 1884.—*First Quarter.*—Published. *Second Quarter.*—Ready for printer. *Third quarter.*—In hand and well advanced.

The *Weekly* values for accumulated heat, rainfall, and bright sunshine for the seven years 1878 to 1884, are also being calculated as fast as possible; to form, when published, Appendix II. to the Weekly Weather Report.

Telegraphic Reporting Stations.—Malin Head.—Observer still under tuition; reports improving. *Belmullet.*—Reports improving; a new minimum thermometer has been supplied.

(Signed) FREDC. GASTER.

PANTAGRAPH ROOM.

December 1, 1884.

Quarterly Weather Report, Part I., 1877.—The drawing of isobars and wind arrows on chart plates completed, figures and dates inserted, and plates sent to printer.

Part II., 1877.—Isobars and arrows drawn on one chart plate, but figures and dates not inserted. First proof of letterpress revised.

Part III., 1877.—General summary about two-thirds done.

Observatory Returns.—The monthly and annual means of pressure, temperature, and vapour tension, with the monthly maxima and minima, calculated for the 12 months October 1883 to September 1884, for the Kew Committee.

The calculation of the vapour tension and of the daily and five-daily means of temperature for January 1883 is now in hand.

Barometrical Disturbance of August 1883.—Some amount of time has been occupied in connection with the curves and papers relating to this phenomenon.

Harmonic Analyser.—The analysis of the temperature curves for 1881 has been carried as far as Aberdeen, the curves for which station are half completed.

Miscellaneous.—Some tables required for use in connection with the observatory work have been copied, and the usual work of examining and dating the sunshine cards for the month of October done.

R. H. Scott, Esq., F.R.S., &c. (Signed) R. H. CURTIS.

EXAMINATION ROOM.

December 1, 1884.

THE following *Curves* and *Tabulations* have been examined:—January 1883: Four *Thermograms*; Four *Barograms*; and five *Anemograms*.

February 1883.—One *Thermogram*; one *Barogram*.

August 1884.—One *Thermogram*; one *Barogram*.

September 1884.—One *Thermogram*; one *Barogram*.

The *Notes of Errors* for Valencia (July to September 1884), and Kew (October 1883 to September 1884); *Thermograms* and *Barograms* have been copied and forwarded, and about three days of my time have been occupied in drawing up various memoranda, forms, &c.

(Signed) T. E. ALLEN.

Submitted—The following report on the forecasts for November 1884 :—

The letters used have the following signification :—

a complete success.
b partial (*i.e.*, more than half) success.
c partial failure.
d total failure.

NOVEMBER, 1884.

3.30 P.M.

Districts.		Percentages. Wind.	Weather.	Average Forecast.	Percentage of Success a + b.
Scotland, N.	a	28	68	48	84
,,	b	48	24	36	
,,	c	16	4	10	
,,	d	8	4	6	
Scotland, E.	a	36	60	48	78
,,	b	28	32	30	
,,	c	32	8	20	
,,	d	4	0	2	
England, N.E.	a	40	56	48	86
,,	b	44	32	38	
,,	c	12	8	10	
,,	d	4	4	4	
England, E.	a	44	52	48	82
,,	b	32	36	34	
,,	c	24	12	18	
,,	d	0	0	0	
Midland Cos.	a	48	60	54	84
,,	b	28	32	30	
,,	c	20	8	14	
,,	d	4	0	2	
England, S.	a	56	60	58	90
,,	b	32	32	32	
,,	c	12	8	10	
,,	d	0	0	0	
Scotland, W.	a	12	56	34	72
,,	b	52	24	38	
,,	c	28	4	16	
,,	d	8	16	12	
England, N.W.	a	40	56	48	80
,,	b	40	24	32	
,,	c	16	8	12	
,,	d	4	12	8	
England, S.W.	a	40	68	54	84
,,	b	36	24	30	
,,	c	20	4	12	
,,	d	4	4	4	
Ireland, N.	a	40	68	54	88
,,	b	56	12	34	
,,	c	0	8	4	
,,	d	4	12	8	
Ireland, S.	a	32	72	52	78
,,	b	40	12	26	
,,	c	20	12	16	
,,	d	8	4	6	

8.30 P.M.

Districts.		Percentages. Wind.	Weather.	Average Forecast.	Percentage of Success a + b.
Scotland, N.	a	43	64	54	90
,,	b	40	33	36	
,,	c	10	3	7	
,,	d	7	0	3	
Scotland, E.	a	47	60	54	79
,,	b	27	23	25	
,,	c	26	17	21	
,,	d	0	0	0	
England, N.E.	a	57	50	54	86
,,	b	37	27	32	
,,	c	3	20	11	
,,	d	3	3	3	
England, E.	a	30	43	37	75
,,	b	40	37	38	
,,	c	30	17	23	
,,	d	0	3	2	
Midland Cos.	a	47	40	46	86
,,	b	27	53	40	
,,	c	26	3	14	
,,	d	0	0	0	
England, S.	a	40	50	45	87
,,	b	44	40	42	
,,	c	13	3	8	
,,	d	3	7	5	
Scotland, W.	a	24	50	37	64
,,	b	33	20	27	
,,	c	40	30	35	
,,	d	3	0	1	
England, N.W.	a	47	54	51	76
,,	b	17	33	25	
,,	c	26	7	16	
,,	d	10	6	8	
England, S.W.	a	40	54	47	82
,,	b	37	33	35	
,,	c	13	7	10	
,,	d	10	6	8	
Ireland, N.	a	30	64	47	81
,,	b	47	20	34	
,,	c	13	13	13	
,,	d	10	3	6	
Ireland, S.	a	33	57	45	79
,,	b	40	27	34	
,,	c	10	16	13	
,,	d	17	0	8	

SUMMARY.

British Isles	a	38	61	50	83
,,	b	40	26	33	
,,	c	18	8	13	
,,	d	4	5	4	

British Isles	a	40	54	47	80
,,	b	35	31	33	
,,	c	19	12	16	
,,	d	6	3	4	

Reported—That on the 28th of July the Chairman had authorised the following increases of salaries (Letter 2055), which were approved:—

To date from July 1st:—	£	
Mr. F. Brodie - - -	10	per annum.
Mr. H. Harries - -	10	„
Mr. W. Allingham - -	10	„
Mr. W. G. James - -	10	„
To date from March 31st:—	£ s. d.	
Mr. A. R. Simpkins to -	2 2 0	per week.
Mr. A. H. Bell to -	1 10 0	„
Mr. J. Sheerman to -	2 5 0	„

The following boys were allowed 2*s*. per week each, making the salaries for—

	s.		*s*.
E. J. Hood - - -	16	J. T. Williams - -	20
W. H. Parsons - -	14	H. J. Griffith - -	19
L. H. Powers - -	11	C. Heinemann - -	16
C. A. Bracey - -	15	C. Pycock - - -	12
H. G. Brown - -	12		

Reported—That the following cheques had been drawn during the month of November:—

1884.			£	*s*.	*d*.
Nov. 1st	For weekly salaries - - - - -		30	4	0
„ 8th	Kew Committee, verifications - - - -		29	13	3
„ „	For weekly salaries - - - - -		30	4	0
„ 12th	G. A. Gillett, wood, oil, &c. - - - -		1	10	8
„ „	Bank of England, sale of Stationery Office forms -		2	5	6
„ „	D. McGregor & Co., Glasgow agents - - -		9	3	9
„ „	Chance Bros., glass balls - - - -		7	10	0
„ „	R. J. Lecky, sunshine recorder frames - -		6	10	0
„ 15th	For weekly salaries - - - - -		30	4	0
„ 22nd	J. Jackson, violet copying ink - - - -		2	4	0
„ „	Pickford & Co., carriage of parcels - - -		3	18	3
„ „	For weekly salaries - - - - -		30	4	0
„ 29th	„ „ - - - - -		29	4	0
„ „	R. H. Scott, salary - - - - -		66	13	4
„ „	J. S. Harding, jun., salary - - - -		27	15	6
„ „	T. D. Bell, salary - - - - -		14	8	10
„ „	J. E. Cullum, salary - - - - -		16	13	4
„ „	R. H. Curtis -	Discussion, &c. of observations	22	4	5
„ „	J. A. Curtis -		16	13	4
„ „	T. E. Allen -		15	11	1
„ „	C. H. Thompson		11	13	4
„ „	S. Call - -		10	16	8
„ „	E. G. Aldridge -		9	15	10
„ „	F. Gaster -	Preparation, &c. of Weather Reports.	31	14	4
„ „	F. J. Brodie -		20	11	8
„ „	G. G. Francis -		20	12	10
„ „	A. J. Rigby -		16	5	0
„ „	R. Sargeant -		13	0	3
„ „	Captain H. Toynbee - -	Discussion &c. of observations, and care of instruments.	33	6	8
„ „	Nav. Lieut. C. W. Baillie, R.N. -		20	16	8
„ „	R. Strachan - - -		27	15	6
„ „	C. Harding - - -		22	4	5
„ „	H. Harries - - -		14	3	4
„ „	W. Allingham - - -		14	3	4
„ „	W. G. James - - -		10	8	8
„ „	Friedlander and Son, books - - - -		2	5	0
„ „	Royal Meteorological Society, observations - -		33	6	8
„ „	Postmaster General, telegrams - - -		165	16	4
„ „	J. S. Harding, jun., petty cash - - -		50	0	0
			£921	11	9

116, *Victoria Street, December* 31, 1884.

PRESENT:

LIEUT.-GENERAL STRACHEY IN THE CHAIR.

MR. DE LA RUE. | PROFESSOR STOKES.
MR. GALTON. | MR. STONE.

THE HYDROGRAPHER.

The Secretary was in attendance.

The proof of Mr. Abercromby's "Principles of Forecasting &c.," with Mr. Stone's criticisms thereon, was considered and finally corrected for publication.

Read Letter 2856 from Falmouth, stating that the estimated cost of re-erection of the instruments at the new observatory was 40*l.* (Minutes, p. 73).

Reported that the Admiral Superintendent of Naval Reserves had consented to a continuance of the sea temperature observations (Letter 2837, Minutes, p. 73).

Submitted the following report:—

(M.O. 2890.)

REPORT on the SCOTTISH METEOROLOGICAL STATIONS in connection with the METEOROLOGICAL COUNCIL for 1884.

BAROMETERS.

The barometers at the various stations were compared with Inspector's mercurial standard barometer No. 588, and I have again the satisfaction to report that this standard barometer has not yet once been detected to be out of order. On all tours of inspection it was compared some days before leaving and some days after returning to Edinburgh with Board of Trade Standard No. 958, which remains constantly in my house. The small aneroid No. 11 was also read at each inspection, since such readings, which are quite unsuitable for trustworthy comparison, might possibly be of use in case of an accident occurring to any of the barometers.

The following table gives the corrected readings of Standard No. 588, and the uncorrected readings of the reporting and check barometers at each of the stations, and it will be seen that all the instruments continue to be in excellent order:—

Stations.	Inspector's Standard No. 588, corrected.	Reporting Barometer, uncorrected.	Check Barometer, uncorrected.	Remarks.
Laudale	29·825	29·828	—	House under repair. Check Barometer dismounted.
Stornoway	30·030	30·028	30·029	
Sandwick	29·767	29·780	—	
Dunrossness	29·463	29·462	29·465	
Wick	29·558	29·558	—	In shop.
Do.	29·488	—	29·490	In house.
Dunrobin	29·698	29·797	—	
Inverness	29·556	29·556	—	
Nairn	29·445	29·444	29·443	
Aberdeen	30·164	30·166	—	In Post Office.
Do.	30·117	—	30·118	In house.
Braemar	29·250	29·260	—	
Dundee	30·072	30·070	—	
Glenalmond	29·455	29·454	—	
Leith	29·774	29·765	—	In Post Office.
Do.	29·753	—	29·746	In house.
Pinmore	29·383	29·384	—	
Rothesay	29·765	29·766	—	
Ardrossan	30·094	30·092	—	In Post Office.
Do.	30·062	—	30·061	In house at Saltcoats.
Observatory, King's College, Aberdeen	30·229	30·230	—	

The results of comparisons made with Inspector's Standard Thermometer No. 2522, and the thermometers at the different stations, and at Aberdeen Observatory, are given in the following table.

The readings of the Standard have been corrected for instrumental errors, but none of the Kew corrections for the station thermometers, however, have been allowed for:—

Stations.	Standard No. 2522, corrected.	Dry Bulb.	Wet Bulb.	Spare Thermometer.	Maximum Thermometer.	Minimum Thermometer.	Time in Water, in Minutes.	Change of Temperature of Water.	Notes.
	°	°	°	°	°	°		°	
Laudale - -	60·7	+0·2	+0·1	—	+0·2	+0·2	110	+0·4	
Stornoway -	54·8	+0·6	+0·5	+0·4	−0·3	−0·5	90	Uniform.	
Sandwick -	56·0	+0·2	−0·1	—	+0·5	−0·5	120	+0·5	
Dunrossness -	57·7	+0·3	+0·4	+0·2	+0·3	−0·7	165	+0·3	
Wick - -	62·8	+0·3	+0·4	—	−0·1	+0·1	90	−0·2	
Dunrobin -	61·3	−0·4	−0·5	—	+0·6	−0·6	100	Uniform.	
Inverness -	54·6	—	—	—	0·0	+0·1	100	Do.	Hygrometer broken.
Nairn - -	55·2	+0·2	+0·7	+0·7	−0·1	+1·0	135	+0·2	New one ordered.
Aberdeen -	63·5	+0·4	+0·5	+0·4	+0·6	+0·1	130	Uniform.	
Braemar - -	62·6	+0·5	+0·5	—	+0·5	−0·1	150	Do.	
Dundee - -	57·0	+0·5	+0·5	—	+1·4	−0·4	80	Do.	
Glenalmond -	55·1	+0·1	+0·1	—	+0·1	−0·3	60	Do.	
Leith - -	56·2	+0·2	+0·5	—	0·0	−0·2	50	Do.	
Pinmore - -	48·8	+0·2	+0·3	—	−0·3	−0·1	80	−0·2	
Rothesay -	47·1	−0·1	0·0	—	0·0	−0·3	180	Uniform.	
Ardrossan -	49·7	+0·3	+0·4	+0·1	0·0	−0·3	70	Do.	
Observatory, King's College -	59·8	−0·2	+0·3	—	+0·2	−0·4	180	Do.	Observatory.
Do. -	59·8	+0·2	+0·1	—	+0·2	+0·2	180	Do.	In Stevenson's screen.

Laudale (inspected August 19th).—The instruments were all in good order, and the observations appear to be carefully made. At the time of inspection the house was undergoing extensive repairs, the whole of the interior being nearly gutted. The check barometer was packed away in its box. The reporting barometer was not then removed, but in a few days it was to be taken from its place for a short time. As Mr. Fletcher quite understands the handling of his barometer, it is not supposed that any injury will happen to the instruments during the changes.

As requested, I examined the observation book for 1880, which is one that was supplied by Mr. Newton and has no columns for clouds. In July of that year Mr. Fletcher was from home nearly the whole month, when the observations were made by his brother. These observations Mr. Fletcher seems to have understood at the time, but evidently he cannot now interpret them so as to give the details of cloud correctly, as desired by the Office.

The faulty readings of the minimum thermometer were made by one of Mr. Fletcher's sons, who, contrary to his father's supposition, had not understood the proper method of reading this instrument.

Stornoway (inspected August 25th).—The thermometer screen and rain gauge were removed October 11th, 1883, to the positions indicated in last year's report. These positions are good, and all the instruments were in good order.

The former assistant, Jessie M'Donald, left in September 1883, and since then a younger daughter, Annabella, has assisted a little, but as little attention had been given to teach her, she read the barometer imperfectly. A course of daily systematic instruction was arranged and commenced, by which she would be taught to read the instruments, reduce the observations, and prepare the weather telegram. She is a quick, intelligent girl, just completing her school education, and from correspondence and specimens of her work I have received since the date of inspection, I have no doubt that in September last she had qualified herself to act as assistant.

Sandwick (inspected August 27th).—The instruments were in excellent order, and to meet contingencies, another of Dr. Clouston's servants, Ann Souter, had been taught to observe, which she does quite correctly.

The orientation of the anemograph was examined. The cardinal points on the horizon were determined by magnetic compass, a variation of about 23° being allowed for. These points agreed with the points determined by Mr. Scott some years ago. Referring the indication of the anemograph to these points, the orientation of the instrument was found to be correct.

The spiral thread of the direction pencil was next compared with reference to the sheet on the cylinder which was seen to be correctly placed, the pencil projecting just as far beyond the N. line at the foot as it did beyond the N. line at the top of the sheet. A careful examination, however, showed that from a point about mid-way between N.E. and N. the spiral thread of the pencil had received a twist, so that this portion will cease to mark till the rest of the pencil be worn down some little way. Fortunately, however, the pencil has been so long in use that the indications which fail at the foot of the sheet are supplied by indications at the top, and this is done so completely that no hiatus is left. Instructions were accordingly given to fix the sheet on the cylinder as before.

A reference to the curves in the Meteorological Office will show when the anemograph ceased to record this part of the curve, whether, for instance, it was at the time when the instrument was last repaired by a local workman.

At the time of inspection the wind suddenly changed from about E. to S.S.E., blowing, roughly speaking, from six to eight miles an hour, and dying away to a calm in a space of time less than 10 minutes. The anemograph seemed much too sluggish in indicating this change of direction.

While afterwards inspecting the observatory at King's College, Aberdeen, I made inquiry regarding the working of the anemograph there, and Mr. Boswell kindly showed me changes in the wind's direction, with small velocities, on the sheets of August 31st, and September 1st and 3rd. On the first of these dates at 10 p.m., with a velocity at the rate of four miles an hour, the anemograph recorded a change from S.W. to W. almost instantaneously.

It may be a matter for consideration by the Meteorological Council whether during next year's inspection Mr. Whipple should not go to Sandwick and put this anemograph into a thorough state of repair.

Dunrossness (inspected August 30th).—The instruments were in good order and were correctly observed. The maximum and minimum thermometers are neither of them engraved on the stem, and as the error of the latter is large $-0^{\circ}\cdot 7$ it might be considered whether a new set of these thermometers might be supplied to this station.

The delay in the receipt of the telegrams from Dunrossness has not been occasioned by any remissness on the part of the observer or of the telegraph clerk at Boddam, but has arisen entirely at Lerwick. The postmaster at Lerwick informed me that scarcely if ever are the weather telegrams so late as 8.30 a.m., 2.30, or 6.30 p.m. The telegrams on reaching Lerwick must wait their turn to be transmitted, which, during the herring season, for example, means sometimes a delay of three or four hours. Another cable is to be laid in April next, when these delays, I was informed, will cease.

The observations of the previous eight months were examined as to the entries of extreme wind force. So far as Mr. Brand could recollect, every case equalling 8 or upwards was reported at the time. The number of cases was smaller than I should have anticipated, though Mr. Brand's estimate of force agrees closely with that of the observers at the other stations.

Wick (inspected September 2nd).—The observations here are made with much intelligence and the instruments were in very good order. Orders were given to execute some necessary repairs on the thermometer screen and repaint it.

Dunrobin (inspected September 4th). —The instruments remained as at the time of last year's inspection, the Stevenson's screen not having been added owing to a difficulty the joiner had in understanding the sketch-plan sent. This was explained and the screen would be ready in a few days after inspection.

The amount of cloud is to be added to the observations. An attempt will also be made to observe the force of the wind, but it must be added that the hills to the westward and the woods in the immediate neighbourhood render it difficult to make quite satisfactory observations of the force of the wind.

Inverness (inspected September 5th) —The observations at this station have, for various causes, been for some time interrupted. Mr. Fraser removed to his present house, of which he has taken a lease for some years, in May last, but delayed resuming the observations till after inspection, when he could have advice regarding the positions of the instruments.

A new hygrometer had been ordered and was being compared at Kew, and it was fully expected that the observations would be resumed on October 1st.

Nairn (inspected September 6th).—The Stevenson screen was ordered to be repaired and repainted, and the rain gauge to be removed to a place 24 feet S.S.E. of its present position, the change being necessary owing to the growth of a young apple tree. At last the trees in the adjoining plantations have been cut down for a distance of from 50 to 80 yards from the boundary wall of the school grounds, thus greatly improving the station in many respects. Much attention is given by Mr. Penny to the instruments and to the systematic training of his assistant.

Aberdeen (inspected September 9th).—The Stevenson screen was painted immediately after last inspection and everything was in excellent order. Mr. M'Cormack is enthusiastic in the work. Both assistants made the observations and reduced them with correctness and despatch. Other two of the clerks were under training as assistants, should their services be at any time required.

Aberdeen, King's College Observatory (inspected September 10th).—The instruments were all in excellent order. The anemometer and its registrations were examined with some care, and the results showed it to be in remarkably good working order. A Stevenson screen has recently been added to the observatory and has been placed in the best situation afforded by the University grounds. The ground for some distance round the screen is to be turfed and the thermometers have been hung in positions and at heights comparable with those at the ordinary stations of the Office. As the results of the comparison of the thermometer did not quite agree with last year's comparison, I remained an hour longer, and thereafter Mr. Boswell and I made another independent reading of all the thermometers which agreed with two previously made readings. Hence the thermometer's errors given in the table are the comparisons by two observers of the thermometers with No. 2522 (corrected), all the thermometers having been in water together for three hours during which its temperature did not change so much as the tenth of a degree.

Office

Braemar (inspected September 11th).—The instruments were in good order. A Stevenson screen, was just added with maximum and minimum thermometers and a hygrometer, with which observations have been made since October 1st for comparison with those made in the screen used at the station since 1855. The force of the wind is observed both by estimation and by Robinson's Anemometer, which is on a stout post with ladder 18 feet high.

Dundee (inspected September 16th).—The instruments were all in good order, and they are observed with care. In August a new 5-inch rain gauge had been added to the station for comparison with the Fleming's gauge hitherto in use, both being placed in an open situation near each other in the grounds of the cemetery about a furlong from the thermometers.

Glenalmond (inspected September 29th).—The instruments are all in the positions in which they were when the late Dr. Percy Robinson was observer, and they are in excellent condition. The observations are made with much care by the Rev. A. H. S. Pattrick, M.A., music master, who, if his duties in the College will admit of it, will add the 9 p.m. observations to those now made.

Leith (inspected September 26th).—Except a slight discolouration in the muslin of the wet bulb, the instruments were in good order, and much interest is manifested by Mr. Hay in the observations and work of the assistants. The gate of the small railed-in enclosure, where the rain gauge and screen are placed, was ordered to be repaired.

Pinmore (inspected October 9th).—The instruments were in good order. The ground for some distance round the thermometer screen has been turfed since last inspection, and the minimum thermometer lowered to 4 feet. The observations are intelligently made, and the observer is desirous of making the schedule as full as may be in his power. Owing to the position of Pinmore, the winds are not unfrequently very light, and they can indicate only in a rough manner the general direction of the wind in that part of Scotland. No little trouble is taken by Mr. Donald, by climbing to the top of a knoll and otherwise, to secure correct observations of the wind. Fuller notes of weather and cloud are gradually to be added.

Rothesay (inspected October 11th).—The instruments were in good order and the observations very intelligently made. Since last inspection several low-growing shrubs have been removed from near the thermometer screen, and a plot has been turfed round the rain gauge. The direction of the wind is taken from a vane which works well on a pole 36 feet high. The amount of cloud is to be added to the schedule.

Ardrossan (inspected October 13th).—The instruments at this station were in good order, and both Mr. Mayes and the assistant made and reduced the observations correctly. The observation book was examined from January 1st downwards, and as regards the wind, an improvement commenced in the last week of January. The estimates of wind force were examined in detail, and these agreed on the whole very well with the estimates made at the other stations, with perhaps a tendency to rate the force one grade of Beaufort scale higher than the others. The faulty observations of the barometer pointed out by the Office were compared with those at the same dates made in Edinburgh, and, except in one doubtful case, the errors suspected by the Office were corroborated. The errors were not generally 0·050 inch, but mostly errors of 0·030 inch, some of them, perhaps made by the assistant, who at the time was new to the work, setting the vernier about 0·030 inch too low, but mostly by a 6 being put down for a 9, a 3 for an 8, and *vice versâ*. The readings of June 1st, made by the assistant, were altogether wrong. An improvement began in June, since which time I did not detect any faulty observations. The rain gauge on July 5th and 10th had been tampered with, and Mr. Mayes much regretted that he failed to report the fact to the Office when he became aware of it. The more important sections of the recent issue of "*Instructions on Meteorological Telegraphy*" were gone over in detail with the two observers, and as both seemed thoroughly alive as to the requirements of the future, I have considerable confidence that their work will now prove satisfactory.

(Signed) ALEXANDER BUCHAN.

December 27, 1884.

Read—A memorandum from Captain Toynbee reporting that since the last meeting 2 logs had been received, both of them being "excellent."

Observer.	Ship.	Period.	Voyage.	Last mention on Minutes.
Capt. J. Dunbar -	S.S. "Arracan"	Sept. 6—Dec. 12, 1884.	Liverpool, Rangoon, and home.	1883, p. 117.
Capt. John Smith -	Barque "Cross Hill."	June 5, 1883—Nov. 29, 1884.	Cardiff, Yokohama, Kobe, New York.	1882, p. 110.

Mr. Scott was instructed to convey the best thanks of the Council to the above observers.

HAY HARVEST FORECASTS, 1884.

SIR,

I BEG to submit herewith a report on the Hay Harvest Forecasts for 1884.

The issue of the forecasts commenced with those for the Midland Counties and England S., on June 9th, and as the time advanced those for other districts were added. The forecasts were issued daily (except on Sundays), and in most cases were continued for about five weeks. To Knutsford, however, they were sent for an additional five weeks at the expense of Lord Egerton of Tatton.

The result of the checking shows that the percentage of complete success is 43, or scarcely so high as in 1883, but that the partial successes (42) were higher than those for last year. This gives 85 as a general percentage of success, which value, though scarcely so high as in 1883, is still very much higher than in any of the previous years. The largest percentages were reached in England S. and England E.; the values being 95 and 94 respectively, while the smallest proportion of good forecasts (78) was in England S.W.

It may be again remarked that the thundery weather in the northern districts was successfully forecast.

The following is a brief resumé of the larger table on p. 91 :—

SUMMARY of RESULTS.

Districts.	Names of Stations.	Percentages.				Total Percentage of Success.
		Complete Success.	Partial Success.	Partial Failure.	Total Failure.	
SCOTLAND, N. - -	Golspie and Munlochy - -	39	43	16	2	82
SCOTLAND, E. - -	Longniddry, Glamis and Grange	38	45	15	2	83
ENGLAND, N.E. -	Chatton and Ulceby - -	48	35	14	3	83
ENGLAND, E. - -	Rothamsted and Thorpe - -	56	38	4	2	94
MIDLAND COUNTIES -	Cirencester and Gerrard's Cross -	43	44	11	2	87
ENGLAND, S. - -	Maidstone and Downton -	53	42	5	—	95
SCOTLAND, W. -	Islay, Dumbarton, and Stranraer	50	37	12	1	87
ENGLAND, N.W. -	Knutsford, Leyburn, and Prescot	41	40	15	4	81
ENGLAND, S.W. -	Glastonbury, Bridgend (Glamorgan), Clifton, and Falfield.	31	47	16	6	78
IRELAND, N. - -	Hollymount, Moynalty, and Antrim	32	49	13	6	81
IRELAND, S. -	Kilkenny, Ardfert, and Moneygall	37	42	18	3	79
	Mean for all districts - -	43	42	12	3	85

The remarks made by Major Smith and Messrs. Birkbeck and Dawson are worthy of note, and it may be added that the proposal to cease the forecasts was followed in several instances by a request for their further continuance.

I am, &c.

To R. H. Scott, Esq.,
Secretary, Meteorological Council.

(Signed) FREDC. GASTER.

HAY HARVEST FORECASTS, 1884.

RETURN showing the NUMBER of FORECASTS sent to each of the under-mentioned PERSONS, with the SUCCESS or otherwise of the FORECASTS.

Districts.	To whom sent.	Address.	No. of Forecasts sent.	No. of Forecasts checked.	Percentages.				Remarks.
					Complete Success.	Partial Success.	Partial Failure.	Total Failure.	
0. SCOTLAND, N.	D. Melville, for the Rev. Dr. Joass.	Dunrobin Gardens, Golspie	30	30	30·0	46·7	20·0	3·3	Major Smith says that the forecasts were correct on the whole, particularly those from the 12–16 August, the forecasts on those days being "very satisfactory."
	Major Smith	Munlochy, Inverness	35	35	48·6	40·0	11·4	—	
1. SCOTLAND, E.	W. S. Macdonald	Craigielaw, Longniddry	30	29	44·8	24·2	24·1	6·9	
	G. Johnstone	The Gardens, Glamis, Forfar	30	30	40·0	56·7	3·3	—	
	A. F. Leslie	Braes Grange, Banffshire	24	24	29·2	54·1	16·7	—	
2. ENGLAND, N.E.	J. Wilson	Chillingham Barnes, Chatton, Northumberland.	30	30	43·3	43·3	13·4	—	
	J. Turner	The Grange, Ulceby	30	30	53·3	26·6	13·4	6·7	
3. ENGLAND, E.	Sir J. B. Lawes, Bart.	Rothamsted, Harpenden	24	24	50·0	41·7	4·1	4·2	
	W. Birkbeck	High House, Thorpe, Norwich	24	24	62·5	33·3	4·2	—	Mr. W. Birkbeck remarks that the "forecasts have been very successful."
4. MIDLAND COUNTIES	Professor Ohm	Royal Agricultural College, Cirencester.	36	36	47·2	47·2	5·6	—	
	Charles King, for the Duke of Somerset.	Gerrard's Cross, Bucks	30	30	40·0	40·0	16·7	3·3	
5. ENGLAND, S.	C. Whitehead	Barming House, Maidstone	30	30	56·7	40·0	3·3	—	
	E. P. Squarey	The Moot, Downton, Wilts	30	30	50·0	43·3	6·7	—	
6. SCOTLAND, W.	J. S. R. Ballingal	Eallabus, Bridgend, Islay, Greenock.	30	30	53·3	30·0	16·7	—	
	W. Calder	Castle hill, Dalreock, Dumbarton	30	30	60·0	33·3	6·7	—	
	M. J. Stewart	Ardwell, Stranraer	30	30	36·6	46·7	13·4	3·3	
7. ENGLAND, N.W.	J. F. Smith, for Lord Egerton of Tatton.	Tatton Park, Knutsford	60	47	40·4	40·4	14·9	4·3	
	G. W. Wray	Leyburn, Yorkshire	30	30	40·0	50·0	6·7	3·3	
	F. Harrison, for the Earl of Derby.	Knowsley Gardens, Prescot	30	27	44·5	29·6	22·2	3·7	
8. ENGLAND, S.W.	R. Neville	Butleigh Court, Glastonbury	30	30	33·3	46·7	16·7	3·3	
	Colonel T. P. Turbervilie	Ewenny Priory, Bridgend	30	30	20·0	46·7	23·3	10·0	
	T. Dyke	Long Ashton, Clifton, Bristol	30	24	29·1	50·0	16·7	4·2	
	J. Harle, for the Earl of Ducie.	Whitfield, Falfield, R.S.O.	30	30	43·3	43·3	6·7	6·7	
9. IRELAND, N.	Rev. A. Brown	The Manse, Hollymount	30	29	48·2	44·8	3·5	3·5	
	E. F. Farrell	Moynalty, Kells	30	30	13·3	66·7	16·7	3·3	
	J. B. Johnstone	Antrim Castle, Antrim	30	30	33·3	36·7	20·0	10·0	
10. IRELAND, S.	D. A. Milward	Lavistown, Kilkenny	36	36	30·6	44·4	19·4	5·6	Mr. D. A. Milward says that "the accuracy of the forecasts is remarkable."
	W. Talbot Crosbie	Ardfert Abbey, Ardfert	30	30	40·0	40·0	16·7	3·3	
	D. A. McCready	Larchvale, Moneygall	30	30	40·0	43·3	16·7	—	

Reported—That the following cheques had been drawn during the month of December:—

1884.			£	s.	d.	£	s.	d.
Dec.	6th	For weekly salaries	-		-	29	4	0
,,	13th	Bond & Son, office repairs	13	9	0			
,,	,,	Wightman & Co., printing	2	7	0			
						15	16	0
,,	,,	L. P. Casella, altazimuth	5	13	5			
,,	,,	Hopkin & Williams, chemicals	3	0	8			
,,	,,	Johnson, Matthey, & Co. ,,	2	11	2			
						11	5	3
,,	,,	For weekly salaries	-		-	29	4	0
,,	20th	,, ,,	-		-	29	4	0
,,	24th	J. S. Harding, junr., petty cash	-		-	29	4	0
,,	31st	R. H. Scott, salary	-		-	66	13	4
,,	,,	J. S. Harding, junr., salary	27	15	6			
,,	,,	T. D. Bell, salary	14	8	10			
						42	4	4
,,	,,	J. E. Cullum (Valencia), salary	-		-	16	13	4
,,	,,	R. H. Curtis — Reduction, &c. of observations.	22	4	5			
,,	,,	J. A. Curtis — Reduction, &c. of observations.	16	13	4			
,,	,,	T. E. Allen — Reduction, &c. of observations.	15	11	1			
,,	,,	C. H. Thompson — Reduction, &c. of observations.	11	13	4			
,,	,,	S. Call — Reduction, &c. of observations.	10	16	8			
,,	,,	E. G. Aldridge — Reduction, &c. of observations.	7	16	8			
						84	15	6
,,	,,	F. Gaster — Preparation, &c. of Weather Reports.	31	5	8			
,,	,,	F. J. Brodie — Preparation, &c. of Weather Reports.	21	0	5			
,,	,,	G. G. Francis — Preparation, &c. of Weather Reports.	20	7	2			
,,	,,	A. J. Rigby — Preparation, &c. of Weather Reports.	16	5	0			
,,	,,	R. Sargeant — Preparation, &c. of Weather Reports.	13	5	9			
						102	4	0
,,	,,	Capt. H. Toynbee — Discussion, &c. of observations and care of instruments.	33	6	8			
,,	,,	Nav. Lieut. C. W. Baillie, R.N. — Discussion, &c. of observations and care of instruments.	20	16	8			
,,	,,	R. Strachan — Discussion, &c. of observations and care of instruments.	27	15	6			
,,	,,	C. Harding — Discussion, &c. of observations and care of instruments.	22	4	5			
,,	,,	H. Harries — Discussion, &c. of observations and care of instruments.	14	3	4			
,,	,,	W. Allingham — Discussion, &c. of observations and care of instruments.	14	3	4			
,,	,,	W. G. James — Discussion, &c. of observations and care of instruments.	10	8	8			
						142	18	7
,,	,,	C. W. Jacques, rent	158	15	0			
,,	,,	Pall Mall Coal Co., coals	11	0	0			
						169	15	0
,,	,,	Williams & Norgate, books	6	7	7			
,,	,,	E. Higgs, repairs in office, &c.	12	12	4			
						18	19	11
,,	,,	J. S. Harding, senr., pension	-		-	10	14	1
,,	,,	T. De La Rue & Co., sun cards	-		-	14	0	0
,,	,,	W. Thomas, care of Scilly anemometer	2	14	4			
,,	,,	,, meteorological reports*	8	2	5			
						10	16	9
,,	,,	H. Williams, care of bridled anemometer	2	12	3			
,,	,,	,, ,, Robinson's ,,	2	15	1			
						5	7	4
		Carried forward	-			£828	19	5

* Bonus of 3*l.* 3*s.* allowed.

1884.			£	s.	d.	£	s.	d.
		Brought forward -	-		-	828	19	5
Dec.	31st	C. Niven, Aberdeen observatory - -	67	10	5			
,,	,,	J. L. E. Dreyer, Armagh ,, - -	13	2	0			
,,	,,	W. L. Fox, Falmouth ,, - -	62	0	5			
,,	,,	Kew Committee, allowance - -	100	0	0			
,,	,,	C. Clouston, Orkney - - -	2	10	0			
,,	,,	G. H. Aird, Seaham - - -	2	12	0			
,,	,,	S. J. Perry, Stonyhurst observatory -	13	14	3			
,,	,,	J. E. Cullum, Valencia ,, -	45	0	8	306	9	9
,,	,,	G. T. Watson, care of Yarmouth anemometer - - -	4	3	6			
,,	,,	,, meteorological reports* -	7	11	0			
						11	15	4
,,	,,	J. O'Driscoll, rent, Valencia - -	25	0	6			
,,	,,	R. Jenkins, thermometer screens - -	6	5	0			
						31	5	6
,,	,,	W. McCormack, Aberdeen* - -	3	3	0			
,,	,,	J. W. Mayes, Ardrossan* - -	3	3	0			
,,	,,	H. Todd, Cambridge* - - -	7	19	10			
,,	,,	H. Mohn, Christiania - - -	5	10	0			
,,	,,	T. Macgowan, Donaghadee* - -	3	3	0			
,,	,,	J. Costello, Dover - - -	5	0	0			
,,	,,	P. Curnow, Dungeness - - -	4	11	11			
,,	,,	W. Edmonds, ,, - - -	2	8	0			
,,	,,	W. Brand, Dunrossness* - - -	7	1	6			
,,	,,	W. Foster, Hawes Junction* - -	5	2	6			
,,	,,	C. Durham, Holyhead - - -	3	18	7			
,,	,,	G. G. Appleton, Hurst Castle* - -	7	2	11			
,,	,,	J. Fisher, Jersey* - - -	7	8	6			
,,	,,	W. Hay, Leith* - - - -	3	3	0			
,,	,,	F. Gaster, London* - - -	7	1	0			
,,	,,	W. Berridge, Loughborough* - -	6	8	6			
,,	,,	Lloyd's, for Malin Head - -	5	0	8			
,,	,,	K. Kerr, Mullaghmore* - - -	8	8	8			
,,	,,	W. D. Penny, Nairn* - - -	7	7	6			
,,	,,	J. W. Irvine, North Shields* - -	3	3	0			
,,	,,	W. Wickham, Oxford* - - -	6	15	6			
,,	,,	G. Phillips, Parsonstown* - -	6	10	6			
,,	,,	J. John, Prawle Point* - - -	6	8	0			
,,	,,	W. Kennedy, Roche's Point* - -	3	3	0			
,,	,,	S. Blake, St. Ann's Head* - -	6	12	1			
,,	,,	J. B. Smith, Spurn Head* - -	6	8	10			
,,	,,	D. Macdonald, Stornoway* - -	8	14	3			
,,	,,	J. Sinclair, Wick* - - -	6	8	0			
,,	,,	A. Guy, York - - - -	3	18	0			
						161	3	3
,,	,,	Postmaster-General, telegrams - -	-		-	201	8	4
,,	,,	W. C. Ley, inspection expenses - -	36	10	1			
,,	,,	,, proportion of salary due -	40	3	7			
						76	13	8
,,	,,	J. Fowler, Cardiff agent - - -	2	10	0			
,,	,,	L. Allen, Dundee ,, - - -	2	11	9			
,,	,,	Z. Scaping, Hull ,, - - -	3	0	0			
,,	,,	J. Gill, Liverpool ,, - - -	19	1	9			
						27	3	6
,,	,,	A. Buchan, salary, 9 months - -	-		-	112	10	0
,,	,,	H. Harries, commissions - -	-		-	7	1	2
,,	,,	J. S. Harding, junr., petty cash - -	-		-	40	0	0
						£1804	9	11

* Bonus of 3*l.* 3*s.* allowed.

116, *Victoria Street, January* 14, 1885.

PRESENT:

LIEUT.-GENERAL STRACHEY IN THE CHAIR.

MR. GALTON.	MR. STONE.
PROFESSOR STOKES.	THE HYDROGRAPHER.

The Secretary was in attendance.

The Minutes of the last two meetings (December 17 and 31) were read and confirmed.

Read—The following letter:—

(M.O. 132.) 73, Portland Place, W.,
January 14, 1885.

DEAR GENERAL STRACHEY,

ALTHOUGH it causes me much regret to sever my connexion with colleagues with whom I have, for so many years, been most agreeably associated. I feel, nevertheless, that the time has arrived when I must definitely resign my seat at the Meteorological Council. As time rolls on I feel more and more that engagements of a fixed nature press upon me, and I do not always feel equal to fulfilling them.

I intend still to contribute to science but such work can be taken up and dropped as I feel disposed.

Kindly convey to my colleagues the purport of this note.

Yours, &c.
(Signed) WARREN DE LA RUE.

The Council adopted the following Resolution :—

"The Meteorological Council have received the intimation of Mr. de la Rue's desire to resign his seat on the Council with much regret, bearing in mind the long period, extending over no less than 18 years, during which he has actively participated in the work of the Meteorological Office. Mr. de la Rue was one of the original members of the Meteorological Committee, and continued to serve upon it until it was merged into the existing Council, of which body he has been a member since its constitution. During the whole of this long series of years he has contributed most useful aid to the work of the Office in all its various branches, and the Council feel that it will be most difficult adequately to replace him.

"The Council also desire that a copy of this Resolution should be communicated to Mr. de la Rue, and that he should be informed that the Council will direct that he shall be presented with copies of their future publications."

The Secretary was instructed to forward a copy of the Resolution to Mr. de la Rue (P.C. 90) and to intimate to the Royal Society the fact of Mr. de la Rue's wish to resign his seat on the Council (P.C. 93).

Reported that the following letter (P.C. 57) had been sent to the Chief Signal Office (Minutes p. 79) :—

(M.O. 2570 and 2746.) Meteorological Office,
January 9, 1885.

DEAR SIR,

I AM instructed by the Council to reply to your kind letters of the 17th and 26th November respecting the arrangements for telegraphy of Atlantic storm reports.

We have waited until we should have gained a little experience of the working of the system before we suggested any changes in it.

The changes we suggest are as follows :—

I. The code must be abandoned, for the Telegraph Company will not transmit any code messages at press rates, and the messages hitherto sent, at the 2*s.* rate, have been charged at 14*s.* each, a cost which is practically prohibitory to us.

II. The signature "Hazen" is not necessary and can be omitted.

III. The name of the ship supplying the report would be a desirable addition.

IV. No despatch should be forwarded which is more than five days old at the most. On the 3rd instant we received a report of the 26th; such a telegram is, of course, valueless for purposes of forecasting.

V. We shall communicate with the lines of British steamers, and supply forms to be handed to the Signal Office officer. The list of these companies running to the States is as follows :—

Allan,	Cunard,	Great Western,	Inman,	National,
Anchor,	Dominion,	Guion,	Monarch,	White Star.

In addition there is the German line, which touches at Southampton. That company is quite independent of this country.

We fear that if the captains be left to post these forms on arrival to the Signal Office Bureau in New York or Boston, considerable delay may occasionally arise.

It may therefore be found possible for the Signal Officer to board each ship immediately on arrival. It would be only necessary to attend to the ships belonging to the lines above enumerated.

If two ships came on one day the two reports, if containing different information, could be included in that days' telegram.

VI. We should propose that the telegram should be as follows :—

Name of ship. Longitude, figures only.
Date. Month not required. Latitude not required.

The rest to be as at present, only in words, not in code. Ice or derelict ships to be given if met with in any longitude or with any wind. The hours to be from 0 to 24. For example, the telegram of December 3rd was—

"Scott. London. Same Commodore nearly Garnish. Hazen." (Seven words at 2*s.* = 14*s.*)

This would be replaced by—

"Met. London. Cambria 29 58 Twenty. South-west. North-west 295." (Nine words at 6*d.* = 4*s.* 6*d.*)

The Council would be glad if you will act at once in the above sense, and stop the use of the code.

I am, &c.
(Signed) R. H. SCOTT,
Secretary.

The Chief Signal Officer,
War Office, Washington.

Read—The following letter :—

(M.O. 2905.)

SIR, Lloyd's, E.C., December 29, 1884.

I HAVE been informed that the New York Maritime Exchange Branch of the Signal Service is to transmit by cable to the British Meteorological Office reports of the weather encountered by steamers crossing the Atlantic from the United Kingdom to the United States. I should be glad if you would be good enough to inform me whether this arrangement has been arrived at, and if so, whether copies of these reports could be obtained for the benefit of Lloyd's.

I am, &c
(Signed) H. M. HOZIER,
Secretary.

The Secretary, Meteorological Office.

The Secretary was instructed to inform Captain Hozier that as soon as the arrangements for the service had been completed, the reports would appear regularly in the Daily Weather Report, and to inquire if this publication would meet the requirements of Lloyd's (P.C. 153.)

Read—A memorandum from Captain Toynbee reporting that since the last meeting 9 logs had been received, 7 of them being "excellent."

Observer.	Ship.	Period.	Voyage.	Last mention on Minutes.
Capt. H. de la Cour Travers.	S.S. "Tartar"	Aug. 1—Dec. 22, 1884.	Plymouth to South Africa (two voyages).	1884, p. 49.
Capt. G. Denham	S.S. "Ocean King."	April 28—Dec. 25, 1884.	Montreal, New York, Alexandria.	1884, p. 8.
Lieut.C. F. Oldham in command. Lieut. A. Leeper.	H.M.Sch. "Lark"	Feb. 13—June 15, 1884.	Australian Station, surveying.	1884, p. 8.
Capt. R. Peebles	Barque "Tweeds dale."	March 27—Dec. 31, 1884.	Liverpool, Calcutta, and home.	1883, p. 136.
Capt. A. S. Thomson. D.W. Barker, Esq.	S.S. "International."	Sept. 9—Nov. 6, 1884.	Laying cable in North Atlantic.	1884, p. 8.
Capt. H. Walker	S.S. "Cephalonia"	July 17, 1884—Jan. 5, 1885.	Liverpool and Boston (eight voyages).	1884, p. 49.
Capt. C. Gadd	S.S. "Parramatta"	July 28, 1884—Jan. 1, 1885.	London, Sydney, and home.	—

Mr. Scott was instructed to present the Charts (O. 27) to Captain Gadd, and to convey the best thanks of the Council to the other observers.

Meteorological Office,
December 31, 1884.

SIR,

I HAVE the honour to report for the information of the Council on the work which has been done for the quarter ending 31st December 1884. The mean pressure charts for the Atlantic, Pacific, and Indian Oceans for the month of November have been drawn, and the whole of the charts are now completed, as far as the observations contained in Office logs are concerned.

I am, &c.

(Signed) C. W. BAILLIE,
Navg. Lieut., R.N.

The Marine Superintendent.

Forwarded for the information of the Council.

(Signed) HENRY TOYNBEE,
Marine Superintendent.

January 13, 1885.

Submitted—The following report on the forecasts for December 1884 :—

The letters used have the following signification :—

a complete success.
b partial (*i.e.*, more than half) success.
c partial failure.
d total failure.

DECEMBER.

3.30 P.M.

DISTRICTS.		Percentages. Wind.	Weather.	Average Forecast.	Percentage of Success a + b.
SCOTLAND, N.	a	23	54	39	72
,,	b	35	31	33	
,,	c	31	8	19	
,,	d	11	7	9	
SCOTLAND, E.	a	31	50	41	70
,,	b	31	27	29	
,,	c	19	15	17	
,,	d	19	8	13	
ENGLAND, N.E.	a	19	46	33	71
,,	b	58	19	38	
,,	c	19	19	19	
,,	d	4	16	10	
ENGLAND, E.	a	27	27	27	70
,,	b	46	39	43	
,,	c	23	19	21	
,,	d	4	15	9	
MIDLAND COS.	a	23	50	37	79
,,	b	46	38	42	
,,	c	31	12	21	
,,	d	0	0	0	
ENGLAND, S.	a	31	62	47	81
,,	b	42	27	34	
,,	c	19	11	15	
,,	d	8	0	4	
SCOTLAND, W.	a	16	46	31	70
,,	b	46	31	39	
,,	c	23	8	15	
,,	d	15	15	15	
ENGLAND, N.W.	a	42	46	44	88
,,	b	42	46	44	
,,	c	8	8	8	
,,	d	8	0	4	
ENGLAND, S.W.	a	38	62	50	91
,,	b	54	27	41	
,,	c	4	7	5	
,,	d	4	4	4	
IRELAND, N.	a	35	66	51	83
,,	b	46	19	32	
,,	c	8	8	8	
,,	d	11	7	9	
IRELAND, S.	a	27	58	43	81
,,	b	54	23	38	
,,	c	12	8	10	
,,	d	7	11	9	

8.30 P.M.

DISTRICTS.		Percentages. Wind.	Weather.	Average Forecasts.	Percentage of Success a + b.
SCOTLAND, N.	a	35	61	48	82
,,	b	39	29	34	
,,	c	16	7	12	
,,	d	10	3	6	
SCOTLAND, E.	a	26	49	38	75
,,	b	42	32	37	
,,	c	16	13	14	
,,	d	16	6	11	
ENGLAND, N.E.	a	19	42	31	68
,,	b	55	19	37	
,,	c	16	23	19	
,,	d	10	16	13	
ENGLAND, E.	a	36	35	36	68
,,	b	32	23	32	
,,	c	16	26	21	
,,	d	6	16	11	
MIDLAND COS.	a	32	49	41	78
,,	b	39	35	37	
,,	c	26	13	19	
,,	d	3	3	3	
ENGLAND, S.	a	39	48	44	78
,,	b	42	26	34	
,,	c	16	16	16	
,,	d	3	10	6	
SCOTLAND, W.	a	26	42	34	67
,,	b	29	36	33	
,,	c	26	3	14	
,,	d	19	19	19	
ENGLAND, N.W.	a	32	45	39	79
,,	b	39	42	40	
,,	c	16	10	12	
,,	d	13	3	8	
ENGLAND, S.W.	a	48	61	55	84
,,	b	39	20	29	
,,	c	3	6	5	
,,	d	10	13	11	
IRELAND, N.	a	39	61	50	87
,,	b	48	26	37	
,,	c	13	10	12	
,,	d	0	3	1	
IRELAND, S.	a	39	55	47	78
,,	b	32	29	31	
,,	c	19	6	12	
,,	d	10	10	10	

SUMMARY.

BRITISH ISLES	a	28	52	40	78
,,	b	46	30	38	
,,	c	18	11	15	
,,	d	8	7	7	
BRITISH ISLES	a	34	50	42	77
,,	b	40	29	35	
,,	c	17	12	14	
,,	d	9	9	9	

Office

Submitted—The following statements of work for December 1884:—

MARINE ROOM.

January 7, 1885.

Examined 8 new logs.

North Atlantic Weather Charts.

Observations at Spitzbergen and several stations in Algeria and extreme North-western America added to charts for August and September 1882, and the consequent alterations carried out in the isobars and isotherms.

First drawing of isobars for January 1883 nearly completed.

First examination of air and sea isotherms for February completed.

Tracings of all data for March completed, and the drawing of air and sea isotherms commenced.

Preparation of observations for the period April to August 1883, contained in Office logs.

The female clerks devoting the whole of their time to the plotting of observations for April, May, and June. The charting of April observations completed.

General.

Indexing data in ocean 10° squares, and obtaining the total number of days' observations in each square for the whole year.

(Signed) CHAS. HARDING.

The Marine Superintendent.

Forwarded for the information of the Council.

(Signed) HENRY TOYNBEE.

January 7, 1885.

TELEGRAPHIC (FORECAST AND STORM WARNING) BRANCH.

January 1, 1885.

Monthly Weather Report, 1884:—

October.—Completed and published.

November.—In printer's hands.

December.—More advanced than usual.

Checking Daily Forecast.—Well up to date.

Hay Harvest Forecast Checking, 1884.—Completed.

Quarterly Summary of Weekly Weather Report:—

Second Quarter.—Complete and published.

Third Quarter.—In printer's hands.

Telegraphic Reporting Stations.—Malin Head will commence reporting on the 1st January 1885.

During this period there has been considerable interruption occasioned by the Christmas holidays, and one of the clerks (Mr. Francis) has been absent for a few days on sick leave.

(Signed) FREDC. GASTER.

PANTAGRAPH ROOM.

January 1, 1885.

Quarterly Weather Report:—Part I., 1877.—Proofs of chart plates checked and the complete part sent to press.

Part II., 1877.—Proofs of letterpress and monthly plates revised ready for press. The isobars and wind arrows drawn on chart plates Nos. 6–9.

Part III., 1877.—General summary completed, but monthly notes not commenced.

Observatory Returns.—The daily and five-days means for pressure and temperature, the hourly vapour tension, and the other totals and means required, have been calculated and checked for the seven observatories for January 1883. The hourly readings for that month have also been copied, and sent to printers.

Harmonic Analyser.—The Analysis of the temperature curves for 1881 has been completed up to Stonyhurst, and the Kew curves are now in hand. Bessel's coefficients for three stations for 1880 have been worked, and used in connection with General Strachey's instrument for drawing harmonic curves.

(Signed) R. H. CURTIS.

R. H. Scott, Esq., F.R.S., &c.

EXAMINATION ROOM.

January 1, 1885.

THE following *Curves* and *Tabulations* have been examined during:—

January (1883): *Barograms*, two stations; *Anemograms*, two stations.

February (1883): *Thermograms*, four stations; *Barograms*, one station.

In addition, the *Valencia* work for October and November 1884, required for the Quarterly Report of the Registrar General of Ireland, has been examined, while the Christmas holidays and vacation, have somewhat interfered with the work of the room during the month.

(Signed) T. E. ALLEN.

E 12184.

It was resolved that an honorarium of 60*l.* be given to Mr. Abercromby for his preparation of the work, "The Principles of Forecasting by Means of Weather Charts." (Minutes p. 86).

Mr. Scott submitted some curves drawn by General Strachey's drawing instrument (Minutes, p. 82), and it was decided to carry out certain modifications in the instrument before adopting it for use.

The Council inspected the instruments which it was proposed to forward to the Inventions Exhibition (Minutes, p. 82), and it was resolved to withdraw the application for space already sent in, inasmuch as the most important instruments are in present use in the Office (P.C. 91).

116, *Victoria Street, January* 28, 1885.

PRESENT:

LIEUT.-GENERAL STRACHEY IN THE CHAIR.

MR. GALTON.	MR. STONE.
PROFESSOR STOKES.	THE HYDROGRAPHER.

The Secretary was in attendance.

The Minutes of the last meeting (January 14) were read and confirmed.

Read—The following letter:—

(M.O. 132.)

73, Portland Place, W., January 16, 1885.

SIR,

BE so good as to express to the Meteorological Council my best thanks for the resolution passed at their meeting of the 14th instant, and my high appreciation of the kind and flattering terms in which they regard my past services.

I beg you also to thank the Council for the grant of future publications, on which I set great value.

I am, &c.

(Signed) WARREN DE LA RUE.

Robert H. Scott, Esq.,
Secretary, Meteorological Council.

Read—The following letter:—

(M.O. 172.)

Signal Office, War Department,
Washington City, January 8, 1885.

SIR,

I HAVE the honour to inform you that, in accordance with the general assent of co-operating weather bureaus, the international and all other simultaneous observations of the Signal Service will, on and after January 1, 1885, be taken eight minutes and twelve seconds earlier than at present. The international observation heretofore taken at 12.08 p.m., Greenwich time, will be taken at 12 o'clock noon, Greenwich time.

I have also the honour to inform you that, in accordance with the general approval expressed by meteorologists in reference to the reduction of barometric readings to the standard gravity at the latitude of 45°, this Office will introduce this reduction in its barometric work on and after January 1, 1885; it will be included in the reduction to sea-level, leaving the actual barometer as hitherto published, corrected for temperature and index error only.

The reduction will be applied by this Office to international simultaneous observations made with unreduced mercurial barometers or with aneroid barometers adjusted by comparison therewith, until notice has been received that the necessary corrections are made by the respective observers.

I am, &c.

(Signed) W. B. HAZEN,
Brig. & Bvt. Maj.-Gen.,
Chief Signal Officer, U.S.A.

R. H. Scott, Esq.,
Secretary, Meteorological Council,
116, Victoria Street, London, S.W., England.

Mr. Scott reported that he had communicated with the observers at land stations, notifying to them the proposed change of time of observation (P.C. 133 and 148), and he was instructed to write to the Admiralty requesting that the time be changed from July 1, 1885 (P.C. 208). He was also instructed to inform General Hazen of the action taken (P.C. 216).

Submitted—The following statement of accounts for the nine months ending 31st December 1884:—

Income.	£ s. d.	£ s. d.
Balance from year 1883–84 - -		820 10 11
Proportion of Vote for nine months -		11,475 0 0
Repayment of expenses charged under—		
(1.) Incidental expenses -	6 1 3	
(2.) Special researches	6 7 11	
(3.) Observatories and stations -	7 16 10	
		20 6 0
Supply of Weather Information:		
D.W. Charts and Forecasts - -	177 7 3	
6 p.m. Charts - -	18 15 0	
Information for Press Agencies, &c. -	65 3 0	
Telegrams - -	186 9 11	
Miscellaneous data -	8 3 10	
		455 19 0
Sale of Instruments, &c.:		
Royal Navy account -	20 18 4	
Mercantile Marine account - -	38 13 8	
		59 12 0
Commission charged on work done for Colonies, &c. - -		20 16 2
		£12,852 4 1

Expenditure.	£ s. d.	£ s. d.
Administration:		
Payment of Council -	750 0 0	
Secretary - -	600 0 0	
Salaries and wages -	569 2 0	
Rent, fuel, and lighting	521 6 2	
Furniture and fittings	33 15 7	
Incidental and contingent expenses -	327 11 8	
Pensions - -	32 2 3	
		2,833 17 8
Special Researches	- -	806 8 4
Land Meteorology:		
Observatories and stations - -	1,339 6 6	
Discussion and reduction of observations -	979 13 9	
		2,319 0 3
Weather Information and Forecasts:		
Telegraphic reports and storm warnings	2,249 4 6	
Preparation and issue of reports and forecasts - -	1,143 0 5	
		3,392 4 11
Inspections:		
Salaries and travelling expenses -		485 12 1
Ocean Meteorology:		
Discussion and reduction of observations -	1,351 3 3	
Expenses incidental to the supply of instruments:		
Proportion for care and issue of instruments -	150 0 0	
Royal Navy -	161 14 3	
Mercantile Marine	237 14 7	
Distant island and coast stations -	14 11 4	
		1,915 3 5
Balance - -	- -	1,099 17 5
		£12,852 4 1

Liabilities.	£ s. d.
To sundry creditors - - -	1,699 5 9
„ balance - - - -	1,099 17 5
	£2,799 3 2

Assets.	£ s. d.
By cash at Bank - - -	1,053 15 2
„ „ at Office - - -	84 17 5
„ „ at Valencia - - -	50 0 0
„ H.M. Exchequer - -	1,475 0 0
„ sundry debtors - - -	135 10 7
	£2,799 3 2

SUBMITTED—The following STATEMENT respecting the RECORDS for January 1883, received from the SELF-RECORDING OBSERVATORIES (see Minutes, 21st December 1868 and 20th November 1876).

—	Aberdeen.		Armagh.		Falmouth.		Glasgow.		Kew.		Stonyhurst.		Valencia.	
ANEMOGRAPH :—	Direction. Good.	Velocity. Good.	Direction. Good.	Velocity. Good.	Direction. Good.	Velocity. Good.	Direction. Good.	Velocity. Good.	Direction. Good.	Velocity. Good.	Direction. Good.	Velocity. Good.	Direction. Good.	Velocity. Good.
Action - - - - -														
Records deficient, due to stoppage of clock -	0	0	0	0	0	0	0	0	0	0	18	19	4	4
„ „ other causes - -	0	*3	0	0	0	0	‡10	‡10	§2	§2	‖8	0	¶1	¶1
Orientation verified - - - -	24th	—	28th	—	16th	—	6th	—	—	—	27th	—	8th	—
No. of errors discovered by subsidiaries -	0	0	0	0	0	0	0	0	0	0	0	0	0	0
„ „ irregular differences -	0	0	1	10	0	1	0	5	0	0	0	1	0	4
Result of 40 *Remeasurements* :—														
Greatest difference - - - -	1·0	1·0	1·0	2·0	1·0	1·0	1·0	3·0	0·0	1·0	1·0	1·0	1·0	2·0
Mean difference irrespective of sign - -	0·1	0·3	0·1	0·6	0·0	0·4	0·2	0·5	0·0	0·3	0·0	0·2	0·1	0·6
Residual difference (—Meteorological Office) -	0·0	0·0	0·0	+0·1	0·0	+0·1	−0·1	+0·1	0·0	+0·1	0·0	0·0	0·0	−0·1

RAIN GAUGE :—														
Action - - - - -	Good.		Good.		Good.		Good.		Good.		Good.		Good.	
Records deficient, due to stoppage of clock -	0		0		0		0		0		0		3 hrs.	
„ „ other causes - -	0		†25		0		0		0		0		0	
Errors in tabulation - - - -	0		0		0		1		0		3		0	

BAROGRAPH —							
Action	Good.	Good.	Good.	Good.	Good.	Good	Good.
Photography	Do.	Fair.	Do.	Indifferent.	Fair.	Do.	Do.
Records deficient, due to stoppage of clock	0	0	0	0	0	4 hrs.	0
„ „ failure of light	0	0	0	0	0	7	0
„ „ other causes	0	**19 ††2	0	0	6	0	0
No. of errors discovered—							
In entry of standard	0	2	2	3	2	‡‡15	0
„ calculating residual correction	0	0	0	4	1	0	0
„ applying residual correction	1	3	2	4	1	1	0
„ subtraction in subsidiary tables	0	0	0	2	2	0	0
„ tabulation by subsidiaries	0	0	0	0	1	0	0
„ „ irregular differences	0	0	0	0	0	0	1
Result of 40 *Remeasurements* :—							
Greatest difference	·005	·005	·008	·005	·007	·005	·008
Mean difference irrespective of sign	·002	·002	·002	·002	·002	·002	·003
Residual difference (—Meteorological Office)	·000	·000	·000	·000	·000	·000	·000
Mean monthly difference between simultaneous Barograph and Barometer readings	·002	·003	·001	·002	·002	·001	·002

THERMOGRAPH :—														
Action	Good.		Good.		Good.		Good.		Good.		Good.		Good.	
Photography	Do.		Do.		Do.		Fair.		Do.		Do.		Do.	
	Dry.	Wet.	Dry.	Wet.	Dry.	Wet.	Dry.	Wet.	Dry.	Wet.	Dry.	Wet.	Dry.	Wet.
Records deficient, due to stoppage of clock	0	0	0	0	0	0	0	0	0	0	0	0	0	0
„ „ failure of light	0	0	0	0	0	0	0	0	0	0	0	0	0	0
„ „ imperfectly moistened bulbs	—	0	—	0	—	0	—	0	—	2	—	0	—	0
„ „ partially frozen bulbs	—	0	—	4	—	0	—	9	—	2	—	2	—	0
„ „ other causes	0	0	††1	††1	0	0	0	0	0	0	0	0	0	0
No. of errors discovered in entry of Standard	0	0	0	0	2	1	1	0	0	0	0	0	0	1
„ „ by subsidiary measurements	0	0	0	0	0	0	0	0	0	2	0	0	0	0
„ „ of subtraction in do. tables	0	0	0	0	0	0	1	0	0	5	0	2	0	0
„ „ detected under glass scale	0	0	0	0	1	0	1	1	0	0	0	0	0	0
Result of 40 *Remeasurements* :—														
Greatest difference	0·2	0·2	0·2	0·2	0·3	0·3	0·2	0·2	0·2	0·3	0·2	0·3	0·3	0·2
Mean difference irrespective of sign	0·1	0·1	0·1	0·1	0·1	0·1	0·1	0·1	0·1	0·1	0·1	0·1	0·1	0·1
Residual difference (—Meteorological Office)	—0·1	0·0	0·0	+0·1	+0·1	+0·1	0·0	0·0	—0·1	—0·1	0·0	0·0	+0·1	+0·1
Mean monthly difference between simultaneous Thermograph and Thermometer readings	0·1	0·2	0·1	0·1	0·1	0·1	0·2	0·2	0·1	0·1	0·1	0·1	0·1	0·2
No. of errors in maxima and minima	0	—	3	—	2	—	3	—	1	—	16	—	4	—

* Instrument damaged. † Snow. ‡ Instrument not sufficiently clamped. § Fitting new clamping pin. ‖ Vane caught.
• Attending to instrument. ** Bad photography. †† Curve not changed at proper time. ‡‡ Fourteen of 1 inch.

Read—The following letter (Minutes, p. 72):—

BEN NEVIS OBSERVATORY.

(M.O. 134.) Scottish Meteorological Society, 122, George Street,
DEAR SIR, Edinburgh, January 15, 1885.

I HAVE submitted to the Directors your letter of December 1st, enclosing extract Minute of the Meteorological Council, intimating that the Council are prepared to continue the grant of 100*l.* yearly on the general basis arranged last year, and with reference to this I am instructed by them to acknowledge this with thanks, and to say that the Directors accordingly will communicate to you copies of the Ben Nevis observations regularly as received from the Observatory.

The Directors received with satisfaction the Council's expression of regret that it is not in their power to increase the yearly grant beyond the sum of 100*l.*, and they beg to express a hope that ere long the Council may be in a position to give an increase.

The Council intimate in the Minute that they will undertake not to publish the actual observations, or to refer to them in their forecasts in a way which would be prejudical to the interests of the Press Association, if last year's arrangement with that body be continued, and request to be informed of the wishes of the Press Association in this respect.

With reference to this, I am instructed to say that the newspapers ceased on December 31st to be supplied through the Press Association with weather telegrams from Ben Nevis Observatory, but an arrangement has been made by the Directors with several newspapers to supply them with the observations direct instead of through the Press Association.

This change of arrangement, however, leaves it as necessary as formerly that there should be no publication of the observations in their bare form which would anticipate the daily reports from Ben Nevis which are supplied to the newspapers.

The Directors will therefore accept the undertaking of the Council not to publish the actual observations, or to refer to them in their forecasts in a way which would be prejudicial to the interests of the Press Association if last year's arrangements with that body had been continued, as applicable to the direct arrangement between the Directors and the newspapers which has taken the place of the indirect arrangement with the Press Association.

The Directors trust that in what has been now said they have made their meaning quite plain, and on the assumption that the Council will be ready to undertake to do in the new position of the arrangement with the Press what they are good enough to express their willingness to do if the old arrangement had remained in force, the Directors will instruct Mr. Omond to use his discretion in telegraphing to the Meteorological Office any striking change of conditions or special phenomenon of interest.

Yours, &c.
(Signed) ALEXANDER BUCHAN.

R. H. Scott, Esq.,
Secretary, Meteorological Council.

Mr. Scott was instructed to reply, as follows:—

(P.C. 225.)
(M.O. 134.) Meteorological Office, London,
DEAR SIR, January 31, 1885.

I AM instructed by the Council to inform you that they have received with satisfaction the statements of the views of the Directors of the Ben Nevis observatory, contained in your letter of the 15th instant, and I am to inform you that the proposals made by the Directors appear to be in conformity with the offers made by the Meteorological Council, and may accordingly be regarded as finally accepted.

I am, therefore, to request that Mr. Omond may be now instructed to commence telegraphing from the observatory on Ben Nevis, and to adhere to the form for occasional telegrams given in our "Instructions for Meteorological Telegraphy," p.p. 6 and 8 (a copy of which book is in his hands), in order to avoid possible misconception of his meaning.

The barometrical readings are to be corrected for temperature but not for altitude.

It may be well to remind Mr. Omond that messages which do not reach London between the hours of 9 a.m. and 8 p.m. on week days, 8–10 a.m. and 6–8 p.m. on Sundays, are practically of little value, and to suggest that observations made during the night should be telegraphed (when thought necessary) at 9 a.m, and that no observations made during the day should be telegraphed later than 7 p.m.

Every endeavour will be made to refer to the Ben Nevis observations in the Daily Weather Report in a manner which shall not infringe on the understanding on the subject, and I am to request you to inform me at once if any objection is made by your Directors to any publication made by this Office of information derived from these reports, when immediate attention will be paid to the matter and errors corrected.

Yours, &c.
(Signed) ROBERT H. SCOTT,
Secretary.

A. Buchan, Esq., F.R.S.E.,
Scottish Meteorological Society.
Edinburgh.

Submitted—The following correspondence (Minutes, p. 95) :—

(M.O. 206.)

SIR, Lloyd's, E.C., January 23, 1885.

I BEG to acknowledge the receipt of your letter of the 22nd inst., with reference to notices of gales and icebergs met with westward of longitude 45° W., as well as notices of derelict ships being telegraphed to your Office, and to inform you that, although the publication of this intelligence will no doubt be valuable to the general public, if the notices appear regularly in the Daily Weather Reports, but that this mode of publishing will by no means be sufficient for the purposes of Lloyd's. It is necessary for Lloyd's that such information should be forwarded to Lloyd's immediately on receipt in this country, especially such as may refer to derelict vessels, and I shall be grateful if you will be good enough to inform me whether an arrangement can be made by which this information shall be forwarded to Lloyd's immediately on its receipt at the Meteorological Office.

I am, &c.
(Signed) H. M. HOZIER,
Secretary.

The Secretary, Meteorological Office,
116, Victoria Street, S.W.

(P.C. 171.)
(M.O. 206.) Meteorological Office, 116, Victoria Street, S.W.,
SIR, January 24, 1885.

I HAVE to acknowledge receipt of your letter of yesterday (1631/84), which shall be brought to the notice of the Council at their next meeting.

In the meantime, however, I would point out to you that the messages in question will be forwarded from America between 6 a.m. and Noon, Greenwich time, and will generally appear at once in the Daily Weather Reports, a copy of which is sent to you by messenger about noon.

If earlier information is wanted either by special messenger or by wire, the Council will no doubt require a proportional payment.

I am, &c.
(Signed) ROBERT H. SCOTT,
Secretary.

The Secretary, Lloyd's.

Submitted—The following correspondence (Minutes, p. 46) :—

(P.C. 175.)
(M.O. 2371/84.) Meteorological Office, 116, Victoria Street, S.W.,
MY DEAR DR. RUSSELL, January 24, 1885.

YOUR letter of October 28th was duly laid before the Council, and I was told to ask you to be so kind as to let them know to what extent you have exceeded the grant, and to let them have a memorandum (with vouchers for the Audit Office), stating the mode of expenditure of the grant already made. It includes an air pump and some other pieces of apparatus.

I am also to ask if you could give them any idea of the probable cost of conducting such further experiments or researches as you would think desirable.

Lastly, I am to say that the Council have no precise understanding as to what proposals Professor Smith made to you, and, as these were made a long time ago, they would be much obliged if you would kindly let me know what idea you had as to personal remuneration.

Yours, &c.
(Signed) ROBERT H. SCOTT.

(M.O. 222.) Chemical Laboratory, St. Bartholomew's Hospital, E.C.,
MY DEAR MR SCOTT, January 27, 1885.

IN answer to your letter of the 24th, I enclose you an account of my expenditure up to the present time and the vouchers. I have taken to all the apparatus that could be used for other work, and have not charged it. The whole expenses amount to 102*l.* 1*s.* 7*d.* On the other hand, the assets which would realise money are the pump and the platinum.

You ask me about what arrangement was made with regard to personal payment. No arrangement was made, and all that I can remember passing on the subject was that Mr. de la Rue, when he asked me whether I would undertake the fog experiments for the Council, said of course it is work that will be paid for.

I am afraid I cannot offhand give you a reliable opinion as to cost of carrying on the experiments; much would depend on how often and how many determinations were made. I will think the matter over and will see you about it.

I am, &c.
(Signed) W. J. RUSSELL.

The subject of the mode of reckoning time was taken into consideration, and it was resolved that no change should be made at present. It was further resolved that from the 1st of January 1886 the tabulations at the observatories and the hourly readings should commence with 0 hours (midnight), instead of with 1 a.m. as at present.

Read—A memorandum from Captain Toynbee reporting that since the last meeting 7 logs had been received, 6 of them being "excellent."

Observer.	Ship.	Period.	Voyage.	Last Mention on Minutes.
Capt. A. Campbell	S.S. "Circassia"	April 5—Oct. 14, 1884.	Moville to New York, 5 voyages.	1884, p. 3.
Lieut. C. F. Oldham, in command, Lieut. A. Leeper.	H.M. Schooner "Lark."	June 16—Oct. 13, 1884.	Australian Station, surveying.	1884, p. 95.
Capt. T. Potter -	S.S. "Durham"	Dec. 11, 1883—Jan. 4, 1885.	European ports - -	1882, p. 102.
Capt. S. Trott R. Ladd (Navigating Officer).	S.S. "Minia" -	Sept. 1, 1884—Jan. 2, 1885.	At Halifax and on cable ground in N. Atlantic.	1884, p. 49.
(C) Mr. W. C. Boynes, Chief Officer.	S.S. "Carn Marth."	July 4, 1884—Jan. 4, 1885.	Naples, New York, and home.	—
(C) Lieut. W. M. Savage, R.N.	Schooner "Richmond."	June 1—Oct. 2. 1884.	Lighthouse tender, Bahamas.	—

Mr. Scott was instructed to present the Charts (O. 27) to Lieut. Savage, the Charts (O. 32) to Mr. Boynes, and to convey the best thanks of the Council to the other observers.

116, *Victoria Street, February* 11, 1885.

PRESENT:

LIEUT.-GENERAL STRACHEY IN THE CHAIR.

MR. GALTON.	MR. STONE.
PROFESSOR STOKES.	THE HYDROGRAPHER.

The Secretary was in attendance.

The Minutes of the last meeting (January 28) were read and confirmed.

Read—The following letter:—

BEN NEVIS OBSERVATORY.

(M.O. 134.)

Scottish Meteorological Society,
122, George Street, Edinburgh, February 10, 1885.

MY DEAR SIR,

I AM instructed by the Directors to acknowledge receipt of your letter of 31st January, and I am to inform you that, in accordance with your desire, Mr. Omond has been instructed to commence telegraphing from the Observatory to the Meteorological Office, and that your wishes as to the form of the occasional telegrams, the times of sending them, and the correction of the barometrical readings solely for temperature, have been communicated to him.

I am further to say that it is satisfactory to the Directors that these occasional telegrams are again to be transmitted to the Office, in the work of which it is hoped they will prove useful.

If anything occurs with reference to the publication by the Meteorological Office of observations from Ben Nevis to which either the Directors or the newspapers with which arrangements have been made take objection, the Directors will communicate with you on the subject, but it is believed that the information you desire can be supplied to you without giving rise to any objection.

R. H. Scott, Esq., Secretary,
Meteorological Office.

(Signed) ALEXANDER BUCHAN.

Mr. Scott reported that the Chief Signal Office (Letter 310) had discontinued the use of the code as suggested by him (Minutes, p. 94), and that the reports were now arriving more frequently.

He was instructed to inquire if M. Mascart wished the reports to be transmitted regularly to him.

Mr. Scott reported that he had learned from Lloyd's that the insertion of the Atlantic telegrams in the Daily Weather Reports would suffice for the requirements of that office (Letter 286).

Office

Reported –That the electrical anemometer (Minutes, 1883, p. 99) had been inspected on the 29th ultimo at the Postal Telegraph Stores, Chalk Farm, by the Chairman and Mr. Galton, and that instructions had been given to send the instrument to Kew to be erected there for the purpose of testing.

Read—The following letter (Minutes 1883, p. 78) :—

(M.O. 248.)

Trinity House, London, E.C.,
January 30, 1885.

SIR,

IN compliance with the request contained in your letter of 2nd instant, I beg to transmit herewith a full report as to the working of the anemometer on board the "Newarp" light vessel from 23rd April to 31st December last.

The instrument on trial on board the "Galloper" lightship has unfortunately been broken, and will shortly be returned to the Meteorological Department.

I am, &c.
(Signed) B. E. DRAYNER.

Robert H. Scott, Esq.,
Meteorological Department,
116, Victoria Street, S.W.

Mr. Scott was instructed to have the damaged anemometer repaired and sent to Kew for comparison with the standard instrument, and to submit a report on the returns from the "Newarp" lightship.

Mr. Scott reported with reference to Mr. Baillie's memorandum (Minutes, p. 82), that for the Atlantic and Indian Oceans he could not find that much information was derivable from "recent publications by foreign institutes," but that he had applied to the Hydrographic Office, Washington, for copies of observations for the Pacific. (P.C. 193)—Approved.

Reported—That Mr. Bevan had resigned his writership at the Office on the 10th instant.

Resolved—That the vacancy be filled by a female clerk.

Submitted—The following statements of work for January 1885 :—

MARINE ROOM.

February 5, 1885.

Examined 18 new logs.

North Atlantic Weather Charts.

First drawing of isobars for January 1883 completed, and for February nearly so.

First drawing of air and sea isotherms for March completed.

European isotherms for April and May prepared, and American isobars and isotherms and European isotherms added to April and part of May charts.

Tracings of data for April commenced.

Received from Mr. Hicks and tested 150 glass pens for use in reducing the charts.

The female clerks employed in advancing the plotting of data for May and June. One of the branch compelled by illness to be absent for thirteen days.

General.

Totalling ocean data in 10° squares completed to log 5826.

Copying hydrographical notices from the log of the S.S. "Minia." Also the observations in a rough book into log 6027.

(Signed) CHAS. HARDING.

The Marine Superintendent.

Forwarded for the information of the Council.

(Signed) HENRY TOYNBEE,
Marine Superintendent.

February 1885.

TELEGRAPHIC (FORECAST AND STORM WARNING) BRANCH.

January 31, 1885.

Monthly Weather Reports, 1884.—*November* completed, revised, and sent "for press."

December. Now in proof.

Checking Daily Forecasts.—3.30 p.m. and 8.30 p.m. Up to date.

Quarterly Summary of the Weekly Weather Report 1884:—

Third Quarter.—Completed and published.

Fourth Quarter.—In printer's hands, expected to be issued about 10th February.

Appendix II. is now being pressed forward for printing.

Telegraphic Reporting Stations.—Malin Head.—Began to report by wire, twice daily, on January 1st. The barometric readings are not yet satisfactorily transmitted, but the observer is being instructed by letter, and is improving.

Belmullet.—Still needs some instruction. The observer is now ill, and a substitute is observing.

The reports from our various stations have been carefully examined, and, where necessary, instructions and corrections are being forwarded to the various observers.

Storm Warning Checking 1884.—To facilitate this work printed forms have been prepared; nearly all the necessary documents are now in hand.

(Signed) FREDC. GASTER.

EXAMINATION ROOM.

February 2, 1885.

The following *Curves* and *Tabulations* have been examined:—

FEBRUARY (1883), *Barograms*, five stations; *Anemograms*, seven stations. MARCH (1883), *Thermograms*, six stations; *Barograms*, one station.

In addition, the VALENCIA work for *December* 1884, required for the Quarterly Report of the Registrar General of Ireland, has been examined, and the notes of errors and monthly report thereon for *February* 1883, have been written out.

(Signed) T. E. ALLEN.

PANTAGRAPH ROOM.

February 1, 1885.

Quarterly Weather Report, Part II., 1877.—Revised proof of letterpress and plates examined. Isobars and arrows drawn on chart plates X.

Part III., 1877.—Monthly notes partly done; Monthly charts drawn, and tables prepared.

Observatory Returns.—The hourly vapour tension worked daily, and five daily means for pressure and temperature calculated; hourly readings copied and sent to printer, &c., for February 1883. The calculation of vapour tension, and the temperature means for March 1883 begun.

Proof of January "Hourly Readings" partly checked.

Harmonic Analyser.—The analysis of the temperature curves for 1881 completed, and the constants calculated. The temperature curves for 1882 are now in hand; Valencia and Armagh are completed, and Glasgow begun. A good deal of time was spent in drawing experimental curves &c. with General Strachey's instrument.

Miscellaneous.—The Bunhill Row sunshine cards for fouth quarter of 1884 tabulated for Royal Meteorological Society.

A quantity of sectional paper was examined before sending to Toronto.

(Signed) R. H. CURTIS.

R. H. Scott, Esq., F.R.S.

Reported—That the cash accounts for the six months ended the 30th September 1884 were audited by the Chairman and Mr. Stone on the 4th instant, and had been sent to the Treasury for the Audit Office. The receipts for the six months, exclusive of a balance of 1,447*l.* 17*s.* 7*d.* on the 1st April 1884, amounted to 7,101*l.* 14*s.* 0*d.* The payments amounted to 7,426*l.* 8*s.* 8*d.*, leaving a balance of 1,123*l.* 2*s.* 11*d.* in hand and at the Bank on the 1st October 1884, exclusive of a cheque for 3*l.* 18*s.* 6*d.* drawn 30th June and not presented prior to 30th September.

Read—A memorandum from Captain Toynbee reporting that since the last meeting 6 logs had been received, all of them being "excellent."

Observer.	Ship.	Period.	Voyage.	Last mention on Minutes.
Capt. W. C. Crutchley, R.N.R.	S.S. "Kaikoura"	Oct. 28, 1884—Jan. 30, 1885.	New Zealand viâ the Cape.	1884, p. 48.
Capt. J. F. L. P. Maclear. Lieut. W. V. Howard.	H.M.S. "Flying Fish."	Aug. 15—Dec. 4, 1884.	Surveying China seas -	1884, p. 78.
Capt. A. M'Dougall	"Auckland" -	Feb. 19, 1884—Jan. 23, 1885.	New Zealand and home -	1883, p. 90.
Capt. W. Scott -	Barque "Commewyne."	Sept. 4, 1884—Jan. 27, 1885.	Surinam and home -	1884, p. 49.
Capt. A. Simpson - (Certificate 19,365).	Barquentine "Traveller."	April 4—Nov. 2 1884.	Peterhead, Ivigtut, Philadelphia, Esbjerg (Jutland).	1883, p. 108.
Capt. W. C. Smith -	"Thirlmere" -	Nov. 14, 1883—Nov. 26, 1884.	Sydney and San Francisco	1883, p. 55.

Mr. Scott was instructed to convey the best thanks of the Council to the above observers.

Submitted—The following report on the forecasts for January 1885 :—

The letters used have the following signification :—

a complete success.
b partial (*i.e.*, more than half) success.
c partial failure.
d total failure.

JANUARY.

3.30 P.M.

Districts.		Percentages. Wind.	Weather.	Average Forecast.	Percentage of Success a + b.
Scotland, N.	a	33	59	46	80
"	b	41	26	34	
"	c	15	8	11	
"	d	11	7	9	
Scotland, E.	a	30	48	39	82
"	b	48	37	43	
"	c	11	8	9	
"	d	11	7	9	
England, N.E.	a	56	52	54	86
"	b	30	33	32	
"	c	11	11	11	
"	d	3	4	3	
England, E.	a	59	41	50	85
"	b	33	37	35	
"	c	8	11	10	
"	d	0	11	5	
Midland Cos.	a	45	63	54	84
"	b	44	15	30	
"	c	11	15	13	
"	d	0	7	3	
England, S.	a	59	59	59	84
"	b	30	19	25	
"	c	11	11	11	
"	d	0	11	5	
Scotland, W.	a	41	52	47	76
"	b	26	33	29	
"	c	26	15	21	
"	d	7	0	3	
England, N.W.	a	41	59	50	86
"	b	41	30	36	
"	c	15	7	11	
"	d	3	4	3	
England, S.W.	a	48	67	58	82
"	b	33	15	24	
"	c	15	11	13	
"	d	4	7	5	
Ireland, N.	a	44	70	57	83
"	b	41	11	26	
"	c	8	15	12	
"	d	7	4	5	
Ireland, S.	a	30	74	52	82
"	b	52	8	30	
"	c	11	7	9	
"	d	7	11	9	

8.30 P.M.

Districts.		Percentages. Wind.	Weather.	Average Forecast.	Percentage of Success a + b.
Scotland, N.	a	39	55	47	81
"	b	32	36	34	
"	c	16	3	10	
"	d	13	6	9	
Scotland, E.	a	32	45	39	76
"	b	39	36	37	
"	c	16	13	15	
"	d	13	6	9	
England, N.E.	a	29	49	39	87
"	b	61	35	48	
"	c	10	13	12	
"	d	0	3	1	
England, E.	a	49	39	44	89
"	b	48	42	45	
"	c	3	10	7	
"	d	0	9	4	
Midland Cos.	a	42	55	49	83
"	b	45	23	34	
"	c	13	9	11	
"	d	0	13	6	
England, S.	a	61	49	55	86
"	b	29	32	31	
"	c	10	13	11	
"	d	0	6	3	
Scotland, W.	a	26	52	39	75
"	b	42	29	36	
"	c	23	16	19	
"	d	9	3	6	
England, N.W.	a	39	52	46	84
"	b	42	35	38	
"	c	19	7	13	
"	d	0	6	3	
England, S.W.	a	52	74	63	88
"	b	29	20	25	
"	c	16	6	11	
"	d	3	0	1	
Ireland, N.	a	42	71	57	88
"	b	42	20	31	
"	c	13	6	9	
"	d	3	3	3	
Ireland, S.	a	36	65	51	81
"	b	42	19	30	
"	c	19	10	15	
"	d	3	6	4	

SUMMARY.

British Isles	a	44	59	52	83
"	b	38	24	31	
"	c	13	11	12	
"	d	5	6	5	

British Isles	a	41	55	48	84
"	b	41	30	36	
"	c	14	10	12	
"	d	4	5	4	

Reported—That the following cheques had been drawn during the month of January :—

1885.			£	s.	d.
January 3rd.	For weekly salaries		29	4	0
„ 10th	„ „		29	4	0
„ 14th	G. A. Gillett, wood, &c.		1	10	10
„ „	Anglo-American Telegraph Company, telegrams		6	17	8
„ „	Royal Meteorological Society, observations		13	3	8
„ „	F. Dangerfield, delivery of Daily Weather Charts and lithography		14	16	6
„ „	D. W. Barker, inspections		72	6	5
„ „	D. McGregor and Co., Glasgow agents		11	2	0
„ „	Kew Committee, verifications, &c.		15	10	7
„ „	P. Adie, repairing barometers and glass scale		17	5	0
„ „	Chance Brothers, glass sphere		3	15	0
„ „	R. J. Lecky, sunshine recorder frame		3	5	0
„ „	Waterlow and Sons, sectional paper		4	10	0
„ „	Hon. R. Abercromby, preparation of "Principles of Forecasting"		60	0	0
„ 17th	For weekly salaries		29	4	0
„ 24th	„ „		29	4	0
„ 31st	„ „		29	4	0
„ „	R. H. Scott, secretary		66	13	4
„ „	J. S. Harding, jun., salary		27	15	6
„ „	T. D. Bell, salary		14	8	10
„ „	J. E. Cullum, salary		16	13	4
„ „	R. H. Curtis	Discussion, &c. of observations.	22	4	5
„ „	J. A. Curtis		16	13	4
„ „	T. E. Allen		15	11	1
„ „	C. H. Thompson		11	13	4
„ „	S. Call		10	16	8
„ „	E. G. Aldridge		9	15	10
„ „	F. Gaster	Preparation, &c. of Weather Reports.	30	4	0
„ „	F. J. Brodie		21	0	5
„ „	G. G. Francis		19	13	0
„ „	A. J. Rigby		16	5	0
„ „	R. Sargeant		13	5	9
„ „	Capt. H. Toynbee	Discussion, &c. of observations and care of instruments.	33	6	8
„ „	Lt. C. W. Baillie		20	16	8
„ „	R. Strachan		27	15	6
„ „	C. Harding		22	4	5
„ „	H. Harries		14	3	4
„ „	W. Allingham		14	3	4
„ „	W. G. James		10	8	8
„ „	Gas Light and Coke Co., gas		10	6	0
„ „	Wightman & Co., special printing		8	8	0
„ „	Stationery Office, sale of forms		4	8	8
„ „	Postmaster-General, telegrams		186	8	6
„ „	Spottiswoode and Co., private wire (Prawle Point)		17	0	0
„ „	Negretti & Zambra, new instruments and repairs		75	17	2
„ „	De la Rue & Co., sunshine cards		2	10	2
„ „	H. Harries, observations for Mr. Meldrum		5	14	4
„ „	J. S. Harding, junr., petty cash		50	0	0
			£1,186	7	11

116, *Victoria Street, February* 25, 1885.

PRESENT:

LIEUT.-GENERAL STRACHEY IN THE CHAIR.

MR. DARWIN. | PROFESSOR STOKES.
MR. GALTON. | MR. STONE.
THE HYDROGRAPHER.

The Secretary was in attendance.

The Minutes of the last meeting (February 11) were read and confirmed.

Read—The following letter:—

(M.O. 435.) The Royal Society, Burlington House, London, W.,
February 19, 1885.

SIR,

I AM to inform you that at their meeting held to-day, the President and Council of the Royal Society nominated Professor G. H. Darwin, F.R.S., to fill, as a member of the Meteorological Council, the vacancy occasioned by the resignation of Mr. de la Rue.

I am, &c.
(Signed) G. G. STOKES,
Sec. R.S.

R. H. Scott, Esq., F.R.S.,
Secretary, Meteorological Council.

The Secretary reported that, by instruction of the Chairman, he had summoned Mr. Darwin to attend the present meeting.

Reported—That M. Mascart had stated (Letter 422) that he was ready to commence the receipt of the Atlantic telegrams (Minutes, p. 103).

Mr. Scott stated that he had arranged to forward the telegrams to Paris from the 1st proximo.—Approved.

Mr. Scott stated that he had had an interview with Dr. Russell (Minutes, p. 47), who had stated that, in his opinion, if the examination of the condition of London air were continued, the investigation should proceed on the following lines:—

The constant determination at noon daily of—

A. Carbonic acid } present in the air.
B. Ammonia - }
C. Rain, when collected, as to the amounts of sulphates, chlorides, and ammonia found.
D. The occasional determination of the amount of suspended and dissolved matter in artificially condensed moisture.

Resolved—That an honorarium of 50*l.* be given to Dr. Russell for the researches hitherto carried on by him, and that no further action be taken at present.

Reported—That the four additional self-recording aneroids (Minutes, p. 82) had been procured.

Resolved—That the five stations to be supplied be Valencia, Scilly, Stornoway, Aberdeen, and Yarmouth, and that special instructions be prepared for the observers.

Submitted—A memorandum (Letter 441) from Mr. R. Curtis, suggesting that the use of the Sunshine Tabulation Form be discontinued for such stations as forward the cards to the Office.—Approved.

Reported—That Miss Mary E. Anderson had been appointed to fill the vacancy caused by Mr. Bevan's resignation (Minutes, p. 104), at a salary of 12*s.* 6*d.* per week, commencing March 2, and rising to 1*l.* a week, according to proficiency, as in other cases (Minutes, 1882, p. 86).

Mr. Scott reported that, as complaints had been received of the lateness of arrival of the Daily Weather Reports in the City, when delivered by messengers from Messrs. Dangerfield, he had arranged to undertake the distribution from the Office, and had engaged Commissionaire Forder to do the work, the pay to be 1*l.* 1*s.* weekly. —Approved.

SUBMITTED—The following STATEMENT respecting the RECORDS for March 1883, received from the SELF-RECORDING OBSERVATORIES (see Minutes, 21st December 1868 and 20th November 1876).

——	Aberdeen.		Armagh.		Falmouth.		Glasgow.		Kew.		Stonyhurst.		Valencia.	
ANEMOGRAPH :—	Direction. Good.	Velocity. Good.	Direction. Good	Velocity. Good	Direction. Good.	Velocity. Good.	Direction. Good.	Velocity. Good.	Direction. Good.	Velocity. Good.	Direction. Good	Velocity. Good.	Direction. Good	Velocity. Good.
Action - - - - - - -														
Records deficient, due to stoppage of clock -	0	0	0	0	0	0	0	0	0	0	0	0	0	0
„ „ other causes - -	0	0	0	0	0	0	1	1	0	0	*152	*171	0	0
Orientation verified - - - -	31st	—	31st	—	14th	—	1st	—	2nd	—	29th	—	3rd	—
No. of errors discovered by subsidiaries -	0	0	0	0	0	0	0	0	0	0	0	0	0	0
„ „ irregular differences	0	0	2	0	0	0	13	3	5	5	1	2	4	2
Result of 40 *Remeasurements* :—														
Greatest difference - - - -	1·0	2·0	1·0	1·0	1·0	1·0	1·0	2·0	1·0	2·0	1·0	1·0	1·0	2·0
Mean difference irrespective of sign - -	0·1	0·4	0·0	0·4	0·1	0·3	0·2	0·5	0·3	0·5	0·1	0·4	0·0	0·6
Residual difference (— Meteorological Office) -	—0·1	—0·1	0·0	+0·1	0·0	—0·1	—0·2	—0·1	+0·2	+0·2	+0·1	—0·1	0·0	0·0

RAIN GAUGE :—														
Action - - - - - - -	Good.		Good.		Good.		Good.		Good.		Good.		Good.	
Records deficient, due to stoppage of clock -	0		0		0		0		0		0		5 hrs.	
„ „ other causes - -	0		0		28		0		0		0		0	
Errors in tabulation - - - -	2		0		36		0		0		4		10	

BAROGRAPH :—

Action	Good.	Good.	Good.	Good.	Good.	Good.	Good.
Photography	Do.	Fair.	Do.	Indifferent.	Fair.	Do.	Do.
Records deficient, due to stoppage of clock	0	0	0	0	0	0	0
„ „ failure of light	0	0	0	0	0	1 hr.	0
„ „ other causes	0	0	0	0	0	0	0
No. of errors discovered—							
In entry of standard	1	0	1	2	2	7	0
„ calculating residual correction	0	0	1	3	2	0	1
„ applying residual correction	0	0	0	4	0	3	1
„ subtraction in subsidiary tables	0	0	0	0	1	1	0
„ tabulation by subsidiaries	0	0	0	0	0	0	0
„ „ irregular differences	0	0	2	1	0	10	0
Result of 40 *Remeasurements* :—							
Greatest difference	·005	·005	·017	·005	·006	·006	·005
Mean difference irrespective of sign	·002	·003	·003	·003	·003	·002	·003
Residual difference (—Meteorological Office)	·000	·000	·000	+·001	·000	·000	·000
Mean monthly difference between simultaneous barograph and barometer readings	·002	·003	·002	·002	·002	·001	·001

THERMOGRAPH :—

Action	Good.		Good.		Good.		Good.		Good.		Good.		Good.	
Photography	Do.		Do.		Do.		Indifferent.		Indifferent.		Do.		Do.	
	Dry.	Wet.	Dry.	Wet.	Dry.	Wet.	Dry.	Wet.	Dry.	Wet.	Dry.	Wet.	Dry.	Wet.
Records deficient, due to stoppage of clock	0	0	0	0	0	0	0	0	0	0	0	0	0	0
„ „ failure of light	0	0	0	0	0	0	0	0	1 hr.	1 hr.	0	0	0	0
„ „ imperfectly moistened bulbs	—	11 hrs.	—	0	—	0	—	44 hrs.	—	31 hrs.	—	13 hrs.	—	0
„ „ partially frozen bulbs	—	102 hrs.	—	64 hrs.	—	45 hrs.	—	53 hrs.	—	36 hrs.	—	76 hrs.	—	4
„ „ other causes	0	0	†3	†3	0	0	0	0	0	0	0	0	0	0
No. of errors discovered in entry of standard	0	0	2	0	0	0	1	3	0	0	0	1	0	0
„ „ by subsidiary measurements	0	0	0	0	0	0	0	0	0	0	0	0	0	0
„ „ of subtraction in do. tables	0	0	0	0	1	0	2	4	5	2	0	1	2	1
„ „ detected under glass scale	0	0	0	0	0	0	2	0	0	1	0	0	0	0
Result of 40 *Remeasurements* :—														
Greatest difference	0·2	0·2	0·1	0·2	0·3	0·2	0·2	0·3	0·2	0·3	0·2	0·2	0·2	0·2
Mean difference irrespective of sign	0·1	0·1	0·0	0·1	0·1	0·1	0·1	0·1	0·1	0·1	0·1	0·1	0·1	0·1
Residual difference (—Meteorological Office)	+0·1	0·0	0·0	0·0	−0·1	0·0	0·0	+0·1	−0·1	0·0	+0·1	0·0	−0·1	0·0
Mean monthly difference between simultaneous thermograph and thermometer readings	0·1	0·2	0·2	0·2	0·1	0·1	0·2	0·2	0·2	0·2	0·1	0·2	0·2	0·2
No. of errors in maxima and minima	0	—	4	—	2	—	3	—	1	—	1	—	5	—

* Doubtful owing to frost.

† Irregular action of shutter.

Read—A memorandum from Captain Toynbee reporting that since the last meeting nine logs had been received, seven of them being "excellent."

Observer.	Ship.	Period.	Voyage.	Last mention on Minutes.
Capt. Jas. Clarke -	S.S. "Olbers" -	Aug. 14, 1884—Feb. 13, 1885.	Liverpool, Rio, New York, and home, two voyages.	1884, p. 48.
Capt. H. W. Dyke -	"Markland" -	March 13, 1883—Feb. 1, 1885.	Buenos Ayres, Valparaiso, Mauritius, Bangkok, and home.	1882, p. 79.
Capt. W. M. Grieve	"City of York"	Apr. 11, 1884—Feb. 7, 1885.	Astoria and home -	1883, p. 117.
Lieut. in Command C. F. Oldham. Lieut. A. Leeper -	H.M. schooner "Lark."	Oct. 14—Nov. 24, 1884.	Surveying on Australian Station.	1884, p. 102.
Capt. H. Parsell -	S.S. "Adriatic"	May 30, 1884—Jan. 11, 1885.	New York, five voyages -	1883, p. 54.
Capt. W. Spratly -	S.S. "Mozart" -	Sept. 22, 1884—Jan. 29, 1885.	Rio to Southampton, Monte Video, and home.	1884, p. 31.
0,32 Capt. J. R. McFee -	"Great Victoria"	Oct. 1, 1883—Dec. 28, 1884.	San Francisco and home	—

Mr. Scott was instructed to present the Charts (O. 32) to Captain McFee, and to convey the best thanks of the Council to the other observers.

116, *Victoria Street, March* 11, 1885.

PRESENT:

LIEUT.-GENERAL STRACHEY IN THE CHAIR.

MR. DARWIN. | PROFESSOR STOKES.
MR. GALTON. | MR. STONE.

THE HYDROGRAPHER.

The Secretary was in attendance.

The Minutes of the last meeting (February 25) were read and confirmed.

Reported—That Professor Buys Ballot had written (Letter 501) requesting permission to participate in the receipt of the telegrams from the Chief Signal Office, Washington, and that a reply had been sent (P.C. 504) stating the terms on which a copy of each telegram could be forwarded to Utrecht.—Approved.

Submitted—A copy of the "Barometerbuch zum Gebrauch der Seeleute" by W. v. Freeden, being the German translation of the "Barometer Manual for Seamen" (Minutes, p. 9).

Submitted—An estimate from Messrs. Malby and Sons, for putting on stone the Charts of Atlantic weather, at 15*s* per chart or 30*s*. per day (Letter 509).

Mr. Scott was instructed to obtain a further estimate from Messrs. Malby.

Read—Letter 557 from Falmouth, requesting that a lightning conductor be fixed on the observatory.

Mr. Scott was instructed to reply that in the opinion of the Council it would be sufficient if the metal column of the anemograph were connected with the ground in a satisfactory manner (P.C. 542).

Submitted—The following memorandum:—

MEMORANDUM.

I wish to bring to the Council's notice that I think it would be well to inspect the stations of our agents for supplying the captains of ships with instruments, &c.

The agents are supposed to keep a set of instruments in working order, and to explain them to the captains and officers about to observe for the Office. In several cases I have been led to think that new observers have not been properly instructed in the reading of the barometer, and in the fitting and handling of the other instruments.

Up to the present time there has been no inspection, and I think it would have a beneficial effect to institute one, both as to the quality of the data and the number of observers. The following table will probably help the Council to form an opinion on the subject.

(Signed) HENRY TOYNBEE,
Marine Superintendent,
March 2, 1885.

The second column gives the total number of ships supplied in the given year.

The third column shows how many of the ships in the second column were commanded by new observers who had been obtained by the agent, the rest being old observers, and possibly obtained by other agents.

The fourth column shows the quality of the logs kept by the new observers.

"No Log yet" implies that the ship is still on her first voyage of supply.

"No Log kept" shows that the instruments were returned, but that the Captain had not kept a log.

"Fees stopped" shows cases when it was supposed that the agent had not been sufficiently careful in getting the observers. The Cardiff agent, Captain Fowler, Superintendent of the Sailors' Home, who was strongly recommended, had been pressed to undertake the work rather against his will, as we had great difficulty in finding a man. For this reason it has not been thought advisable to stop fees from him at present, though he has been written to on the subject.

Agency and Year.		No. of Ships Supplied.	No. of first Supplies.	Quality of first Supplies.						Sets of Intruments returned.	Remarks.
				x.	v.g.	g.	No Log yet.	No Log kept.	Fees stopped.		
Aberdeen	1883	4	–	–	–	–	–	–	–	4	Verifies instruments well.
"	1884	4	–	–	–	–	–	–	–	3	
*Cardiff	1883	11	11	0	3	2	3	3	–	2	Verifies instruments badly.
"	1884	13	2	–	–	–	2	–	–	3	
†Dundee	1883	4	1	1	–	–	–	–	–	7	Verifies instruments well.
"	1884	6	2	1	–	–	1	–	–	4	
Glasgow	1883	22	14	3	7	2	–	2	1	2	Verifies instruments very badly.
"	1884	15	9	–	1	–	7	1	1	6	
Hull	1883	2	1	–	–	–	–	1‡	–	1	‡Ship abandoned.
"	1884	3	–	–	–	–	–	–	–	2	Verifies instruments well.
Liverpool	1883	25	4	1	1	–	1	1§	–	18	§Log kept but carried to sea again.
"	1884	29	10	4	–	–	6	–	–	27	Verifies instruments well.
Southampton	1883	4	2	1	1	–	–	–	–	2	Verifies instruments badly.
"	1884	0	0	–	–	–	–	–	–	3	
Met. Office	1883	63	23	13	5	2	2	1‖	–	52	‖Ship foundered.
"	1884	48	12	6	2	–	4	–	–	60	
Total -	-	253	91	30	20	6	26	9	2	196	

NOTE.—Mr. Allingham was visiting at intervals from August 8th, 1882, to August 29th, 1884.
* The Cardiff agent was changed 16th March 1883.
† The Dundee Agent was changed 6th February 1883.

H. T.

Mr. Scott was instructed to arrange about the inspection of the agencies in the current year.

Read—A memorandum from Captain Toynbee reporting that since the last meeting 9 logs had been received, 8 of them being "excellent."

Observer.	Ship.	Period.	Voyage.	Last mention on Minutes.
Capt. C. F. Cooke, F.R. Met. Soc.	"Melbourne" -	May 28, 1884—Feb. 26, 1885.	London, Melbourne, and home.	1883, p. 75.
Capt. F. H. Crotty	"Evesham Abbey."	May 17, 1884—Feb. 20, 1885.	Liverpool, Calcutta, and home.	1883, p. 136.
Capt. R. A. Donaldson.	S.S. "Glenavon"	Oct. 12, 1884—Feb. 21, 1885.	London, China, and home	p. 49.
Capt. C. W. Kennedy	S.S. "Germanic"	Sept. 12, 1884—Feb. 23, 1885.	Between Queenstown and New York (five voyages).	1874, p. 43.
Capt. F. Marshall -	"Wiltshire" -	May 19, 1884—Feb. 18, 1885.	Penarth, Colombo, Chittagong, and home.	—
Capt. P. Murdoch -	"Sierra Estrella"	May 28, 1884—Feb. 18, 1885.	Liverpool, Chittagong, and home.	p. 8.
Capt. C. W. Pearson	S.S. "Strathleven."	July 22, 1881—Jan. 7, 1885.	Yokohama, Shanghai, and New York.	p. 8.
Capt. W. M. Savage, R.N.	Schooner "Richmond."	Oct. 3, 1884—Feb. 3, 1885.	Lighthouse tender at Bahamas.	p. 104.

Mr. Scott was instructed to present the Charts (O. 27) to Captain Marshall, and to convey the best thanks of the Council to the other observers.

Submitted—The following report on the forecasts for February 1885 :—

The letters used have the following signification :—

a complete success.
b partial (*i.e.*, more than half) success.
c partial failure.
d total failure.

FEBRUARY.

3.30 P.M.

Districts.		Percentages. Wind.	Weather.	Average Forecast.	Percentage of Success a + b.
Scotland, N.	a	29	50	40	75
,,	b	33	38	35	
,,	c	21	12	17	
,,	d	17	0	8	
Scotland, E.	a	25	42	34	67
,,	b	46	21	33	
,,	c	17	16	17	
,,	d	12	21	16	
England, N.E.	a	38	29	34	77
,,	b	37	50	43	
,,	c	17	8	13	
,,	d	8	13	10	
England, E.	a	25	42	34	75
,,	b	54	29	41	
,,	c	17	21	19	
,,	d	4	8	6	
Midland Cos.	a	17	38	28	59
,,	b	29	33	31	
,,	c	42	13	27	
,,	d	12	16	14	
England, S.	a	34	50	42	71
,,	b	33	25	29	
,,	c	25	17	21	
,,	d	8	8	8	
Scotland, W.	a	25	67	46	69
,,	b	33	13	23	
,,	c	25	4	15	
,,	d	17	16	16	
England, N.W.	a	33	50	42	69
,,	b	25	29	27	
,,	c	21	0	10	
,,	d	21	21	21	
England, S.W.	a	33	33	33	75
,,	b	38	46	42	
,,	c	25	17	21	
,,	d	4	4	4	
Ireland, N.	a	46	50	48	75
,,	b	25	29	27	
,,	c	13	4	9	
,,	d	16	17	16	
Ireland, S.	a	33	50	42	71
,,	b	38	21	29	
,,	c	13	17	15	
,,	d	16	12	14	

8.30 P.M.

Districts.		Percentages. Wind.	Weather.	Average Forecast.	Percentage of Success a + b.
Scotland, N.	a	32	54	43	81
,,	b	39	36	38	
,,	c	22	10	16	
,,	d	7	0	3	
Scotland, E.	a	50	64	57	77
,,	b	29	11	20	
,,	c	18	18	18	
,,	d	3	7	5	
England, N.E.	a	43	50	47	83
,,	b	29	43	36	
,,	c	18	0	9	
,,	d	10	7	8	
England, E.	a	36	32	34	81
,,	b	50	43	47	
,,	c	7	18	12	
,,	d	7	7	7	
Midland Cos.	a	32	29	31	74
,,	b	36	50	43	
,,	c	25	7	16	
,,	d	7	14	10	
England, S.	a	46	32	39	79
,,	b	32	47	40	
,,	c	18	14	16	
,,	d	4	7	5	
Scotland, W.	a	29	64	47	72
,,	b	25	25	25	
,,	c	28	0	14	
,,	d	18	11	14	
England, N.W.	a	32	50	41	72
,,	b	36	25	31	
,,	c	14	4	9	
,,	d	18	21	19	
England, S.W.	a	50	39	45	81
,,	b	25	47	36	
,,	c	18	7	12	
,,	d	7	7	7	
Ireland, N.	a	47	57	52	83
,,	b	32	29	31	
,,	c	7	4	5	
,,	d	14	10	12	
Ireland, S.	a	54	39	47	81
,,	b	21	47	34	
,,	c	18	7	12	
,,	d	7	7	7	

SUMMARY.

British Isles	a	31	46	39	72
,,	b	36	30	33	
,,	c	22	12	17	
,,	d	11	12	11	
British Isles	a	41	46	44	78
,,	b	32	37	34	
,,	c	18	8	13	
,,	d	9	9	9	

Office

Submitted—The following statements of work for February 1885 :—

MARINE ROOM.

March 5, 1885.

Examined 14 new logs and one light-house register.

North Atlantic Weather Charts.

Further additions and consequent alterations made to early charts.

Except the final examination, the charts have been completed to the end of October 1882.

The first drawing of February 1883 isobars completed, and those for March and April one-third done.

The tracings of all data and the drawing of air and sea isotherms for April well advanced.

Mr. Bevan resigned on the 11th February on being appointed to the Admiralty (Transport Branch).

The female clerks completed the plotting of May, and advancing the plotting of June and July data.

General.

Indexing data in ocean 10-degree squares.

Copying into log 6070 the observations contained in the Rough Book supplied by the captain.

The Marine Superintendent. (Signed) CHAS. HARDING.

Forwarded for the information of the Council, March 1885.

(Signed) HENRY TOYNBEE,
Marine Superintendent.
5/3/85.

TELEGRAPHIC (FORECAST AND STORM WARNING) BRANCH (to February 28, 1885).

Monthly Weather Reports.—1884, *December.*—Ready to be sent finally "for press," but awaiting completion of preface for the whole volume. 1885, *January.*—Copy complete ready to go to printer. A little late this month owing to pressing on Appendix II. of Weekly Weather Report 1884, and several other works. 1884, *February.*—Up to date.

Checking of Daily Forecasts (3.30 p.m. and 8.30 p.m.).—Up to date.

Weekly Weather Report, 1884:

Fourth Quarterly Summary.—(Part of Appendix I.) Issued.

Annual Summary.—(Completing Appendix I.) Issued.

Appendix II.—Tables I. and II. sent to press; Table III. in hand. It appears that the whole of this will be in printer's hands by end of March.

Issue of Daily Weather Reports by Hand.—This work, hitherto attended to by Mr. Dangerfield, has been transferred to this Branch. Arrangements have been made for carrying it out regularly, and for providing the proper supply of covers, &c.

Telegraphic Reporting Stations.—Malin Head.—Barometric readings still need great attention. *Belmullet.*—Reports much improved; wind observations still appear unsatisfactory at times.

Storm Warning Checking, 1884.—Commenced and will be pushed forward as quickly as possible.

(Signed) FREDC. GASTER.
10/2/85.

PANTAGRAPH ROOM.

March 2, 1885.

Quarterly Weather Report, Part II., 1877.—Figures, dates, &c. inserted on chart, plates VI. to X.; plates sent to printer.

Part III., 1877.—Isobars, &c. drawn on chart, plates XI. to XII. All letterpress and tables, &c. completed and sent to printer.

Observatory Returns.—The hourly vapour tension worked; pressure and temperature means calculated; the copying of the Hourly Readings for March 1883 nearly completed. The calculation of temperature means for April 1883 commenced. Proof of January Hourly Readings checked and returned for press.

Harmonic Analyser.—The Analysis of the temperature curves for 1882 completed for five observatories.

Miscellaneous.—Some time has been occupied on special tabulations, checking, &c. of sunshine cards; and I have myself spent several days upon the barometer curves for August 1883, the date of the "Krakatoa Air Wave."

R. H. Scott, Esq., F.R.S. (Signed) R. H. CURTIS.

EXAMINATION ROOM.

March 2, 1885.

THE following *Curves* and *Tabulations* have been examined :—March 1883 : *Thermograms*, one station; *Barograms*, five stations; *Anemograms*, seven stations.

April 1883.—*Thermograms*, four stations; *Barograms*, two stations.

In addition the notes of errors and Monthly Report thereon for March 1883 have been written out.

(Signed) T. E. ALLEN.

Reported—That the following cheques had been drawn during the month of February:—

1885.			£	s.	d.
Feb.	7th	P. E. Chappuis, daylight reflector	5	17	6
„	„	J. J. Hicks, thermometer screen, &c.	2	17	0
„	„	For weekly salaries	29	4	0
„	14th	„ „	27	17	4
„	21st	Pall Mall Coal Co., coals	8	16	0
„	„	Anglo-American Telegraph Co., telegrams	7	14	0
„	„	For weekly salaries	27	4	0
„	28th	„ „	27	4	0
„	„	R. H. Scott, salary	66	13	4
„	„	J. S. Harding, junr., salary	27	15	6
„	„	T. D. Bell, salary	14	8	10
„	„	J. E. Cullum, salary	16	13	4
„	„	R. H. Curtis — Discussion, &c. of observations.	22	4	5
„	„	J. A. Curtis — Discussion, &c. of observations.	16	13	4
„	„	T. E. Allen — Discussion, &c. of observations.	15	11	1
„	„	C. H. Thompson — Discussion, &c. of observations.	11	13	4
„	„	S. Call — Discussion, &c. of observations.	10	16	8
„	„	E. G. Aldridge — Discussion, &c. of observations.	7	16	8
„	„	F. Gaster — Preparation, &c. of Weather Reports.	30	4	0
„	„	F. J. Brodie — Preparation, &c. of Weather Reports.	20	11	8
„	„	G. G. Francis — Preparation, &c. of Weather Reports.	19	13	0
„	„	A. J. Rigby — Preparation, &c. of Weather Reports.	16	5	0
„	„	R. Sargeant — Preparation, &c. of Weather Reports.	13	0	3
„	„	Capt. H. Toynbee — Discussion, &c. of observations and care of instruments.	33	6	8
„	„	Lieut. C. W. Baillie — Discussion, &c. of observations and care of instruments.	20	16	8
„	„	R. Strachan — Discussion, &c. of observations and care of instruments.	27	15	6
„	„	C. Harding — Discussion, &c. of observations and care of instruments.	22	4	5
„	„	H. Harries — Discussion, &c. of observations and care of instruments.	14	3	4
„	„	W. Allingham — Discussion, &c. of observations and care of instruments.	14	3	4
„	„	W. G. James — Discussion, &c. of observations and care of instruments.	10	8	8
„	„	W. J. Russell, experiments on fog and rain	50	0	0
„	„	Post Office, telegrams, &c.	267	2	9
„	„	J. H. Woodstock, packing cases	3	9	6
„	„	R. Jenkin, thermometer screen	2	0	0
„	„	J. S. Harding, junr., petty cash	50	0	0
			£962	5	1

116, *Victoria Street, March* 25, 1885.

PRESENT:

LIEUT.-GENERAL STRACHEY IN THE CHAIR.

MR. DARWIN.	PROFESSOR STOKES.
MR. GALTON.	MR. STONE.

THE HYDROGRAPHER.

The Secretary was in attendance.

The Minutes of the last meeting (March 11) were read and confirmed.

Read—The following correspondence (Minutes, 1884, p. 60) :—

(P.C. 543.)

DEAR SIR, Meteorological Office, March 12, 1885.

I AM instructed by the Council to inquire whether the arrangements for the maintenance of their self-recording apparatus at Glasgow have yet been completed, as if not it might be desirable to have the instruments removed. Your letter of November 21 mentions "a few weeks," and fifteen have now elapsed.

Yours, &c.

Prof. R. Grant, F.R.S. (Signed) ROBERT H. SCOTT.

(M.O. 615.) The Observatory, Glasgow,

DEAR SIR, March 17, 1885.

No arrangement has yet been effected for maintaining permanently a course of meteorological observations at this observatory conducted by means of self-recording instruments, but negotiations with a view to that object are still in progress.

If the Meteorological Council wishes to have the instruments at this observatory belonging to them returned forthwith I shall give every facility for their removal.

I am, &c.

Robert H. Scott, Esq. (Signed) R. GRANT.

Resolved—That the instruments be left in Prof. Grant's hands for three months longer, and that at the end of that time he be again communicated with.

Mr. Scott was instructed to communicate this resolution to Prof. Grant (P. C. 635).

Mr. Scott was instructed to request the Kew Committee to allow Mr. Whipple to go to Falmouth to superintend the erection of the Meteorological instruments at the new observatory (Minutes, 1883, p. 76).

Read—An amended estimate from Messrs. Malby for putting on stone the charts of Atlantic weather, three days (six charts) on a page, for 4*l.* per page (Minutes, p. 112).

Mr. Scott was instructed to communicate this estimate to the Stationery Office.

Submitted—The following correspondence : —

(P.C. 193.)

DEAR SIR, Meteorological Office, January 28, 1885.

I HAVE to acknowledge, with thanks, the receipt of your letter of the 16th instant. I should be much obliged if you would kindly give me a statement showing the approximate amount of barometer observations (not means) which you have for the Pacific Ocean, and their distribution.

I should also be glad to know whether a copy of the observations could be supplied to this Office, at the cost of copying?

Yours, &c.

(Signed) ROBERT H. SCOTT,

Secretary.

Commander Bartlett, U.S.N.,

Hydrographer, Navy Department, Washington.

(M.O. 644.) Hydrographic Office, U.S. Navy,

Washington, D.C., March 7, 1885.

SIR,

I HAVE the honour to acknowledge the receipt of your letter No. 223 of 28th January, in regard to the number of observations of the barometer used in compiling the meteorological charts of the North Pacific. Referring to page 2 "Meteorological Charts of the North Pacific Ocean "from the Equator to lat. 45° North, and from the American coast to the 180th Meridian," you will see that "the aggregate of the observations for all the squares were for the barometer and "temperature of the open air, each 119,051 hours." Their distribution is explained on the same page. I assume that the reduction of the observations of each observer for each 5 degree square is what you wish. I enclose a copy of such a reduction taken at random from a mass of data, and if

this is what you desire, I shall be glad to furnish you with all our meteorological data of all parts of the world at the cost of copying and paper. Many thousands of hours of observations have accumulated since the publication of the meteorological charts of the North Pacific and North Atlantic. These as well as the data from which they were compiled are entirely at your service. I should like also to make some arrangement with the English Meteorological Office, to receive their data in an elementary form, so as to incorporate it with that in the possession of this Office in the new meteorological charts of the South Atlantic now preparing, and also in the new editions of meteorological charts already published.

Very, &c.
(Signed) J. R. BARTLETT,
Commander U.S. Navy,
Hydrographer.

Robert H. Scott, Esq.,
Secretary, Meteorological Office.

Mr. Scott was instructed to reply that the published means for the Pacific Ocean would probably suffice for the requirements of the Council for the Pressure Charts, and also to inform Commr. Bartlett of the probable cost of copying the data existing in the Meteorological Office (P.C. 691).

Read—A memorandum from Captain Toynbee, reporting that since the last meeting 9 logs had been received, eight of them being "excellent."

Observer.	Ship.	Period.	Voyage.	Last mention on Minutes.
Capt. P. Aldrich; Lieut. W. Richardson.	H.M.S. "Sylvia."	Sept. 20, 1884—Jan. 21, 1885.	Surveying East Coast of South Africa.	1884, p. 48.
Capt. S. H. Bolton	S.S. "Tyne Queen."	Oct. 6, 1884—March 18, 1885.	Hull to Sweden and Norway (4 voyages).	1884, p. 43.
Capt. J. Brown	Barque "Arapura."	Dec. 1, 1883—Jan. 30, 1885.	London, Newcastle, N.S.W., Valparaiso, and home	1883, p. 13.
Capt. G. Denham	S.S. "Ocean King."	Jan. 18—March 5, 1885.	London, New York, and home.	1884, p. 95.
Capt. Thomas England.	Barque "Jane"	Oct 14, 1884—March 16, 1885.	Cardiff, St. Vincent, New Orleans, and home.	1884, p. 49,
Capt. Gilbert Shaw	S.S. "Beta"	Sept. 8, 1884—March 3, 1885.	Jamaica and Halifax, several voyages.	1877 (Committee), p. 11.
Capt. G. Shearer	Barque "Corona"	Nov. 16, 1883—Jan. 26, 1885.	London to Townsville, Newcastle, N.S.W., Callao, Junin, and Hamburg.	1883, p. 66.
Capt. D. Fullarton	"Timaru"	April 17, 1884—Feb. 28, 1885.	London, New Zealand, Oregon and home.	—

0,27

Mr. Scott was instructed to present the Charts (O. 27) to Captain Fullarton, and to convey the best thanks of the Council to the other observers.

The Chairman submitted a scheme for the future organization of the clerical staff of the Office, drawn up in consultation with Mr. Galton and the Secretary, in accordance with Letter 2055 (Minutes, p. 85), with a view to regulating the scale of salaries and the rate of increments, and avoiding the serious inconvenience of having to deal with individual claims for increases.

After discussion the following scheme was adopted :—

REORGANIZATION OF STAFF.

Name.	Rank.	Present Salary.	Increment in 1885.
		£ s. d.	£ s. d.
J. S. Harding	Chief clerk	333 6 8	—
* From £225	CLASS I.—Maximum £275.		
~~R. Strachan~~ Retired 1/4/00	1st Senior clerk (including allowance for care of instruments.)	333 6 8	—
F. Gaster	2nd Senior Clerk	266 13 4	3 6 8
C. Harding	3rd " "	266 13 4	3 6 8
R. H. Curtis	4th " "	266 13 4	3 6 8
J. A. Curtis	5th " "	200 0 0	10 0 0
J.J. Cullum Jan/87		225 - -	

* Minutes 4 July/00.

REORGANIZATION OF STAFF—*continued.*

From £175 — CLASS II.—Maximum £200.

T. E. Allen	1st Junior clerk	186 13 4	8 6 8
F. J. Brodie	2nd " "	182 4 6	2 15 6
G. G. Francis	3rd " "	173 6 8	6 13 4
T. D. Bell	4th " "	173 6 8	6 13 4
A. J. Rigby	5th " "	173 6 8	1 13 4
H. Harries	6th " "	170 0 0	—
W. Allingham	Supernumerary	170 0 0	—

R Sargeant

From £125 — CLASS III.—Maximum £150.

C. H. Thompson	Junior clerk	140 0 0	—
S. Call	" "	130 0 0	—
W. G. James	" "	125 4 0	—
J. Sheerman	" "	117 0 0	3 0 0
R. Sargeant	" "	115 7 0	4 13 0

R Wallace From 1 April 00 (Promoted from Class IV)

Simkins Snell

From £75. — CLASS IV.—Maximum £110.

Left * ~~F. T. Bullen~~ [J T Williams, Apl 96]	Junior clerk	Bullen left May 99.	60	104 0 0	1 0 0
-"- ~~E. G. Aldridge~~ C W Heinemann	Jan/97 "		60	101 16 8	3 3 4
OK ~~H. J. Stevens~~ L H. Powers	Jan/00 "		53	98 16 0	1 4 0
A. R. Simpkins	" "			97 1 4	2 18 8
~~R. F. Wallace~~ Promoted 1/4/00	" "			91 0 0	4 0 0
A. H. Bell	" "			78 0 0	2 0 0
OK ~~R. G. Canham~~ E J Hood	Jan/93 "		60	78 0 0	2 0 0
Fly. Snell (Add[l] Clerk)	Feb/89 "		80		
~~C A Bracey Add[l] " (108 4/00 Jan/01~~			60		
[O.K.] W H Parsons (Clerk Keeper) Apl/93			60—80		
* J T Williams (Supernumerary) Apl/96			£60		

The salaries of unclassified clerks, &c., not to rise above 1*l.* per week.

The above salaries are for eight hours work daily. The payments for 52 weeks have been taken to represent the present yearly amount of the salaries hitherto paid weekly. The order of the names in Classes III. and IV. is that of the amount of the actual payment (for eight hours' work daily), without any regard to questions of seniority. The usual allowances for extra attendance will continue to be granted, subject, however, to revision by the Council at their discretion.

Increments of 5*l.* yearly will be made to the several salaries of the classified clerks as above shown, from the 1st April 1886 until the maximum of their class is reached, but on the specific condition that the increments will only be granted on a report from the immediate superior of each clerk and of the Secretary, to the effect that the clerk's conduct has been in all respects satisfactory. Promotions from one class to another to be made on the occurrence of vacancies in the fixed strength, by selection according to positive merit, and not according to seniority. It is to be understood that the services of any clerk may be dispensed with on three months' notice.

The Council think it necessary to state that the Treasury having declined to recognise the claims to pension of persons employed in the Meteorological Office, it must be understood that no such claim can be recognised by the Council as arising of right, and that the scale of salaries now fixed must be regarded as discharging all liabilities in relation to the services performed in the Office. This will not preclude the Council from considering whether in any special case some retiring allowance may not be made on account of prolonged and meritorious services within the amount available from the grant placed at their disposal.

Increments of 1*s.* per week from March 30, 1885, were allowed to the following assistants:—

Promoted C. A. Bracey,
~~H. G. Brown,~~ Left
~~H. J. Griffith,~~ Left
C. Heinemann, Promoted
E. Hood, -"-
W. H. Parsons, OK.
L. H. Powers, Promoted
C. Pycock. Left.

It was also resolved that the extra allowances to be granted for extra attendance shall for the present be as follows:—

For the clerks who attend one extra hour for Weather Telegraphy an addition at the rate of one eighth of their daily salary.

For attendance at night, after 5 p.m., an additional allowance will be given for each hour at the rate of one half of the ordinary hourly rate; it being understood that the average daily attendance remains at 9 hours.

For Sunday two hours of the attendance will be paid for in addition at the ordinary hourly rate, and the remaining five hours at double the ordinary hourly rate.

SUBMITTED—The following STATEMENT respecting the RECORDS for April 1883, received from the SELF-RECORDING OBSERVATORIES (see Minutes, 21st December 1868 and 20th November 1876).

	Aberdeen.		Armagh.		Falmouth.		Glasgow.		Kew.		Stonyhurst.		Valencia.	
ANEMOGRAPH:—	Direction.	Velocity.	Direction.	Velocity.	Direction.	Velocity.	Direction.	Velocity.	Direction.	Velocity.	Direction.	Velocity.	Direction.	Velocity.
Action	Good.	Good.	Good.	Good.	Good.	Good.	Good.	Good.	Good.	Good.	Good.	Good.	Good.	Good.
Records deficient, due to stoppage of clock	0	0	0	0	0	0	0	0	0	0	0	0	0	0
„ „ other causes	0	*3 hrs.	0	0	†2 hrs.	0	†2 hrs.	†2 hrs.	0	0	‡15hrs.	‡ 14 hrs. ‖3 hrs.	0	0
Orientation verified	21st	—	30th	—	13th	—	30th	—	3rd	—	28th	—	16th	—
No. of errors discovered by subsidiaries	0	0	0	0	0	0	0	0	0	0	0	0	0	0
„ „ irregular differences	0	0	5	0	0	0	1	11	13	0	2	0	6	3
Result of 40 *Remeasurements*:—														
Greatest difference	0·0	2·0	1·0	1·0	0·0	1·0	0·0	1·0	1·0	2·0	1·0	1·0	1·0	2·0
Mean difference irrespective of sign	0·0	0·4	0·0	0·2	0·0	0·2	0·0	0·4	0·1	0·3	0·0	0·2	0·1	0·6
Residual difference (— Meteorological Office)	0·0	−0·1	0·0	+0·1	0·0	0·0	0·0	−0·1	+0·1	0·0	0·0	−0·1	0·0	0·0
RAIN GAUGE:—														
Action	Good.		Good.		Good.		Good.		Good.		Good.		Good.	
Records deficient, due to stoppage of clock	0		0		0		0		0		0		0	
„ „ other causes	0		0		0		0		0		0		0	
Errors in tabulation	0		1		0		0		0		0		7	

BAROGRAPH :—

Action	Good.	Good.	Good.	Good.	Good.	Good.	Good.
Photography	Do.	Fair.	Do.	Fair.	Do.	Do.	Do.
Records deficient, due to stoppage of clock	0	0	0	0	0	0	0
„ „ failure of light	0	0	0	8 hrs.	0	0	0
„ „ other causes	¶4 hrs.	0	0	0	§2 hrs. **4 hrs.	0	††1 hr.
No. of errors discovered—							
In entry of standard	2	0	0	2	1	3	0
„ calculating residual correction	0	0	0	4	1	3	1
„ applying residual correction	1	2	0	1	0	4	2
„ subtraction in subsidiary tables	0	0	0	0	2	0	2
„ tabulation by subsidiaries	0	0	0	0	0	0	0
„ „ irregular differences	0	0	0	0	2	0	1
Result of 40 *Remeasurements :—*							
Greatest difference	·005	·007	·005	·005	·005	·005	·005
Mean difference irrespective of sign	·002	·003	·002	·002	·002	·002	·002
Residual difference (— Meteorological Office)	—·001	+·001	·000	·000	—·001	+·001	·000
Mean monthly difference between simultaneous barograph and barometer readings	·002	·002	·001	·002	·002	·001	·002

THERMOGRAPH :—

Action	Good.		Good.		Good.		Good.		Good.		Good.		Good.	
Photography	Do.		Fair.		Do.		Indifferent.		Fair.		Fair.		Indifferent.	
	Dry.	Wet.	Dry.	Wet.	Dry.	Wet.	Dry.	Wet.	Dry.	Wet.	Dry.	Wet.	Dry.	Wet.
Records deficient, due to stoppage of clock	0	0	0	0	0	0	0	0	1	1	0	0	0	0
„ „ failure of light	0	0	0	0	0	0	0	0	0	§§1 hr.	0	0	10	0
„ „ imperfectly moistened bulbs	—	1 hr.	—	0	—	0	—	0	—	0	—	1 hr.	—	0
„ „ partially frozen bulbs	—	0	—	0	—	0	—	0	—	0	—	2 hrs.	—	0
„ „ other causes	¶¶5 hrs.	¶¶ 5hrs.	0	0	0	0	(*a*) 1 hr	(*a*)5 hrs.	§2 hrs. ††2 hrs.	§2 hrs.	0	0	0	0
No. of errors discovered in entry of standard	0	0	0	0	2	2	1	0	0	0	1	2	3	1
„ „ by subsidiary measurements	0	0	0	0	0	0	0	1	0	0	0	0	0	0
„ „ of subtraction in do. tables	0	0	1	0	1	0	3	3	5	8	1	0	1	1
„ „ detected under glass scale	0	0	0	0	0	0	2	0	0	0	2	0	0	0
Result of 40 *Remeasurements :—*														
Greatest difference	0·3	0·1	0·2	0·2	0·2	0·2	0·2	0·3	0·3	0·2	0·2	0·2	0·2	0·2
Mean difference irrespective of sign	0·1	0·1	0·1	0·1	0·1	0·1	0·1	0·1	0·1	0·1	0·1	0·1	0·1	0·1
Residual difference (— Meteorological Office)	+0·1	0·0	0·0	0·0	0·0	0·0	0·0	+0·1	—0·1	—0·1	0·0	0·0	+0·1	0·0
Mean monthly difference between simultaneous thermograph and thermometer readings	0·1	0·2	0·1	0·2	0·1	0·1	0·2	0·2	0·2	0·2	0·1	0·2	0·2	0·2
No. of errors in maxima and minima	1	—	6	—	1	—	1	—	5	—	3	—	3	—

* Repairing instrument. † Cylinder not clamped. ‡ Doubtful, owing to frost. ‖ Pencil insufficiently pressed. ¶ Standards given : repairing gas pipe.
§ Standards given : attending to gas pipe. ** Chimney choked. †† Standards given : bad photography. §§ Standard given. ‡‡ Bad photography.
¶¶ Four standards given : repairing gas pipe. (*a*) One standard given : gas meter defective.

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